

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

In the Matter of)	
)	
Video Device Competition)	MB Docket No. 10-91
)	
Implementation of Section 304 of the Telecommunications Act of 1996)	
)	
Commercial Availability of Navigation Devices)	CS Docket No. 97-80
)	
Compatibility Between Cable Systems and Consumer Electronics Equipment)	PP Docket No. 00-67

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COMMENTS OF GOOGLE INC.

Google Inc. (“Google”) submits these comments on the FCC’s Notice of Inquiry¹ seeking input on the appropriate steps the Commission should take to unleash competition in the retail market for navigation devices, and how to better implement Section 629 of the Telecommunications Act of 1996 in accord with Congressional intent.

INTRODUCTION AND SUMMARY

The open Internet is beginning to dramatically change how consumers watch and interact with video programming. The Internet’s open, end-to-end functionality has spurred an unprecedented level of convergence and transformed what, where, and how video content is being used. This evolution, along with a choice of multiple platforms from which to access

¹ *Video Device Competition, Notice of Inquiry*, 25 FCC Rcd. 4275 (2010) (“NOI”).

video content, and tools allowing for content personalization, promises to greatly improve the user experience. As the range of potential options has increased, the quantity and diversity of video content, including “over-the-top” Internet video, has reached unprecedented levels.

Despite these impressive advances, significant obstacles remain to realizing the full potential of video convergence.² Consumers simply want access to the most content on the widest range of devices (whatever those devices may be). Generally, there are few technical impediments today to building a search index that combines both broadcast and Internet content, so that users can search for accurate and up-to-date information about the availability of video across different platforms. Too often, however, consumers are constrained from easily navigating the universe of available video content on the platform of their choosing.

At least in part, these obstacles are rooted in the absence of a robustly competitive retail video device marketplace.³ Section 629 of the Telecommunications Act of 1996 requires the FCC to ensure the competitive availability of navigation devices.⁴ But, despite the Commission’s efforts, Congress’ vision of an open and flourishing competitive video device marketplace has not come to fruition.⁵ While a number of entities (including Google through its

² See FCC Open Meeting Presentation “Broadband Gaps” at 17 (Nov. 18, 2009), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-294708A1.pdf; Federal Communications Commission, *Connecting America: The National Broadband Plan*, GN Dkt. 09-51, at 17 (rel. Mar. 16, 2010) (“*National Broadband Plan*”).

³ See, e.g., NOI ¶ 10; *Implementation of Section 304 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices, Compatibility Between Cable Systems and Consumer Electronics Equipment, Fourth Notice of Proposed Rulemaking*, 25 FCC Rcd. 4303, ¶ 8 (2010); *National Broadband Plan* at 50.

⁴ 47 U.S.C. § 549.

⁵ As Congress explained in the legislative history to Section 629, 47 U.S.C. § 549(c), consumers should have a choice of devices, S. Conf. Rep. 104-230 at 181 (Feb. 1, 1996), because “competition in the manufacturing and distribution of consumer devices has always led to innovation, lower prices and higher quality.” H.R. Rep. No. 104-204, at 112 (July 24, 1995).

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upcoming Google TV product) are innovating in this space to enable consumers to access and view the content of their choice on the device of their choice, greater regulatory oversight and direction is needed to spur competition. Indeed, parties from all corners of the video space agree that the current navigation device marketplace is wholly inadequate,⁶ creating what the FCC and others have called a “television set-top box innovation gap.”⁷ The unfortunate result has been limited or non-existent choice in navigation devices to be leased from multichannel video programming distributors (“MVPDs”), a stagnated set of service options, and devices that both lack functionality across video platforms and are not fully portable. Even the relatively few cable-ready retail devices on the market have limited consumer appeal because of the difficulty of self-installing and operating these devices.

Google supports an all-video (“AllVid”) solution like the one put forth in the NOI. Consumers would be well-served by having such an inexpensive universal adapter available at retail, which would feature an easy-to-use, common interface, and employ nationwide interoperability standards to connect to televisions, digital video recording devices (“DVRs”), and other smart video devices. These navigation devices effectively would separate the network interface from the device functionality, making video more “portable” across platforms and

⁶ See, e.g., NOI ¶ 15; *National Broadband Plan* at 51 (“Without the ability to seamlessly integrate Internet video with traditional TV viewing, Internet video devices like Apple TV and Roku have struggled to gain a foothold in U.S. homes”). See also Letter from James W. Hedlund, Vice President, Regulatory Affairs, Consumer Electronics Association, to Marlene H. Dortch, Secretary, FCC, at 2, CS Dkt. 97-80, MB Dkts. 03-15, 08-82 (Sept. 15, 2009); Letter from Kyle McSlarrow, President and CEO, National Cable and Telecommunications Association, to Carlos Kirjner, Senior Advisor to the Chairman on Broadband, and William Lake, Chief, Media Bureau, FCC, CS Dkt. 97-80, GN Dkts. 09-47, 09-51, 09-137 (Dec. 4, 2009).

⁷ See, e.g., NOI ¶ 14; FCC News Release, “FCC Identifies Critical Gaps in Path to Future Universal Broadband,” Nov. 18, 2009; *National Broadband Plan* at 51 (citing the uneven playing field in the retail set-top box market, which has “prompted some companies not to enter the market at all”).

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devices. An approach that builds upon ubiquitous Ethernet and Internet Protocol (“IP”) standards also could allow consumers a greater ability to search for and access content (as via an Internet browser) on both traditional and non-traditional video programming platforms.

Development of technical specifications for an AllVid adapter should occur via an open, participatory, and technology-driven process that includes both established and emerging stakeholders. This process could help kick start innovation and competition in the video device market, while leaving sufficient flexibility to account for technological change.

While the proposed AllVid hardware solution is a good first step, more is necessary to facilitate a truly competitive market for navigation devices. The Commission must encourage – and establish, where necessary – mechanisms to level the playing field for manufacturers and innovators seeking to offer consumers functional and portable alternatives to MVPD-provided devices. Specifically, the Commission should help facilitate industry standardization of a metadata stream that flows with the audio-visual signal, passing undisturbed as it traverses the MVPD-supplied adapter through to the consumer. Likewise, accurate and reliable program data must be widely available to ensure maximum device functionality from all suppliers.

Finally, the Commission should not overlook existing CableCARD devices. As the Commission pursues policies to stoke video device innovation and competition, it should enact targeted measures to promote both one- and two-way CableCARD devices, at least until the AllVid adapters reach a critical mass. Doing so will sustain a viable device option for consumers as competition takes root.

DISCUSSION

I. GOOGLE TV SEEKS TO ACHIEVE THE VAST PRO-CONSUMER POTENTIAL OF VIDEO CONVERGENCE

Empowering consumers to access the entire universe of video content on the screen of their choice – without regard to the content’s source or pathway – will generate substantial benefits to users, developers, and the entire video environment. Google TV attempts to do just that, through client software that enables seamless navigation of content distributed through both traditional and broadband channels. Google TV features a built-in Internet search browser and enhanced functionality that allows consumers to use a single interface to search and access video content from a variety of sources – whether from across the Web, a traditional MVPD (including over-the-air and pay-TV channel listings), or some compatible DVRs. Consumers will also be able to watch streaming video from leading content platforms (including Netflix, Amazon Video On Demand, and YouTube),⁸ use their televisions as music players or game consoles, access cloud-based information and applications, and more.⁹ Google TV’s picture-in-picture layout will provide simultaneous access to multiple windows, while an innovative home screen will help viewers organize their favorite content and personalize their viewing experience.

Google has worked closely with Sony, Logitech, and Intel to deploy Google TV across a variety of devices, including integrations with televisions, Blu-ray players, and IP set-top

⁸ See Richard Lawler, “Sony Internet TV, DISH First With Google TV This Fall; Adobe, Logitech and Others Along For The Ride,” Engadget (May 20, 2010), *available at* <http://www.engadget.com/2010/05/20/sony-internet-tv-platform-is-first-with-google-tv-dish-adobe-and/>.

⁹ See Deborah McAdams, “Google TV Revealed,” Television Broadcast (May 21, 2010), *available at* <http://www.televisionbroadcast.com/article/101006>.

boxes.¹⁰ In May, Sony announced the release of a line of Sony Internet TVs – the first line of standalone televisions to be based on the Google TV platform – and is working on a Blu-ray player that also incorporates the platform.¹¹ Likewise, Logitech has created an IP set-top box that will work with existing high-definition televisions and home entertainment systems, with plans to include video calling features and a variety of input devices, including video chat and a smart-phone application.¹² Google and its partner DISH Network have already begun a beta trial to explore the full potential of integrated access to traditional TV, DVR, and Web content, helping consumers to easily find content and manage their video viewing experience.¹³ Based on continuous user feedback during the trial, Google and DISH are building an interactive video experience that joins the previously separate spheres of traditional pay-TV programming and rich Web content, with plans to make this enhanced Google TV experience available to customers this Fall.

Because Google TV is based on an open platform, it provides innovators and Web developers with numerous opportunities to create new applications that could help shape the future of television.¹⁴ Google plans to release a set of TV-specific application programming

¹⁰ News Release, “Industry Leaders Announce Open Platform to Bring Web to TV” (May 20, 2010), *available at* <http://www.intel.com/pressroom/archive/releases/2010/20100520corp.htm>.

¹¹ Sony Corporation News Release, “Sony to Introduce ‘Sony Internet TV’” (May 20, 2010), *available at* http://news.sel.sony.com/en/press_room/corporate_news/release/57588.html.

¹² A. Arora, “Logitech Revue with Google TV, Blog.Logitech (June 16, 2010), *available at* <http://blog.logitech.com/2010/06/16/logitech-revue-with-google-tv/>; Details, The Future of TV is Coming to Your TV.

¹³ Google and DISH Network News Release, “Google and DISH Network Collaborate to Develop Integrated Multichannel TV and Web Platform” (May 20, 2010), *available at* <http://www.dishnetwork.com/googletv/>.

¹⁴ See Salahuddin Choudhary, “Announcing Google TV: TV Meets Web. Web Meets TV,” The Official Google Blog (May 20, 2010), *available at* <http://googleblog.blogspot.com/2010/05/announcing-google-tv-tv-meets-web-web.html>.

interfaces, which it hopes will encourage developers to begin building unique Web applications for use on television sets.¹⁵ Early next year, Google also plans to make available an updated Android SDK to support applications built for Google TV. Through these and other steps, Google hopes to cultivate a rich media environment unconstrained by today's technical limitations and such arbitrary and irrelevant barriers as screens, pipes, and content source. With plans to make the basic Google TV software stack widely available in open source format, Google also hopes to spark additional innovation among device vendors.

II. GOOGLE SUPPORTS DEVELOPMENT OF AN OPEN, INTEROPERABLE APPROACH TO NAVIGATION DEVICES

Effective, pro-consumer convergence of the television screen and the Internet requires that there be a larger paradigm shift based on openness principles. Unfortunately, market fragmentation, lack of ubiquitous standards, and lengthy commercial negotiations, together have hindered the deployment of converged services in the living room. Access to a limited set of services controlled by the retail device maker or MVPD also has depressed consumer adoption. Further, limited access to high bitrate broadband (particularly in rural areas, and for DSL customers) has constrained the distribution of quality video via the public Internet. While there have been attempts to overcome some of these challenges, no one solution has yet succeeded in overcoming all of these hurdles. The transformation of television from a closed, one-way model to an open, interactive model will stimulate the necessary investment and commitment to technology development, marketing, and consumer education for the next phase of video evolution.

¹⁵ See "Google TV Opens Television to the Web," Connected Vision (May 20, 2010), *available at* <http://informatv.com/news/2010/05/20/googletvopens/>.

From the consumer's perspective, the specific behind-the-scenes mechanisms of media origin and output are largely irrelevant. Regardless of whether video is piped through Ethernet, WiFi, or coaxial cable, or whether the video computer processing is housed in a set-top box, a PC, media extender, or smartphone, the consumer simply wants access to the broadest universe of content that any given device can provide. To the consumer, it remains true that "content is king."¹⁶ However, artificial barriers today are hampering consumers' abilities to move seamlessly between content and platform. As the FCC has noted, ease and openness of access to content are the keys that will drive widespread adoption of both newly convergent video platforms and the broadband networks that power them.¹⁷ Just as the FCC over 40 years ago mandated the right to attach any non-harmful device to the wireline telephone network,¹⁸ and more recently adopted a policy statement¹⁹ and proposed similar rules for devices in the broadband context,²⁰ so too should the same overarching openness rationale extend to the video device marketplace.

¹⁶ See, e.g., Dave Thomas, "Media Is On Demand - But Content Is Still King," The Nielsen Company, Apr. 2009 (there appears to be no upper limit on consumer demand for video content on multiple screens including traditional TV, mobile devices and the Internet), available at http://en-us.nielsen.com/content/nielsen/en_us/insights/consumer_insight/april_2009/media_is_on_demand.html.

¹⁷ *National Broadband Plan* at 17-18.

¹⁸ *Use of Carterfone Devices in Message Toll Telephone Service*, Decision, 13 FCC Rcd. 420, 424-25 (1968). See also *Amendment of Section 64.702 of the Commission's Rules and Regulations (Second Computer Inquiry)*, Final Decision, 77 FCC 2d 284, at ¶¶ 142, 149 (1980), modified on recon., 84 FCC 2d 50 (1980) and 88 FCC 2d 512 (1981), *affd sub nom.*, *Computer and Commun. Industry Ass'n v. FCC*, 693 F.2d 198 (D.C. Cir. 1982), *cert. denied*, 461 U.S. 938 (1983).

¹⁹ *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, Policy Statement, 20 FCC Rcd. 14986, ¶ 4 (2005).

²⁰ *Preserving the Open Internet*, Notice of Proposed Rulemaking, 24 FCC Rcd. 13064, ¶¶ 92, 104, 119 (2009).

A. Functional separation of network interfaces from consumer devices will promote increased device functionality and portability.

To achieve the Congressional goals underlying Section 629, the FCC should employ the type of platform openness approach that has propelled the growth of broadband services and innovative broadband-based devices.²¹ Each broadband provider today supplies its customers with an interface device (*e.g.*, modem) that performs network-specific functions and connects via an Ethernet port to customer-premise devices (*e.g.*, computer, printer, routers). This functionally “layered” approach, which was first facilitated by the FCC’s “Carterfone” standards requirement, spawned an enormous (and still growing) range of broadband-capable devices that satisfy user demand and fill market niches.²² Similarly, the advent of low-cost devices utilizing IEEE 802.11 standards has triggered exceptional device availability.²³

The FCC should draw on this impressive legacy to drive innovation and competition by encouraging MVPDs to provide a standard interface that is functionally separate from feature-rich consumer devices. While the adapter should perform basic tuning and security functions,

²¹ See NOI ¶ 20.

²² For instance, in 2009, an estimated 50 broadband enabled TV models debuted, and as of September 2009, 15 million broadband-enabled Xbox consoles and an estimated 650,000 Roku units were purchased, while 1.6 million standalone TiVo subscribers were reported as of the end of June 2009. Dan Rayburn, “Breakdown on the Number of Broadband Enabled Devices Sold in the U.S., Business of Video” (Sept. 15, 2009), available at http://blog.streamingmedia.com/the_business_of_online_vi/2009/09/breakdown-on-the-number-of-broadband-enables-devices-sold-in-the-us.html.

²³ See *Availability of Advanced Telecommunications Capability in the United States, Fourth Report to Congress*, 19 FCC Rcd. 20540 (2004) (noting increases of over 200% in commercial Wi-Fi data devices driven by the availability and low cost of IEEE Standard 802.11b, 802.11a, and 802.11g embedded products.) See also *Internet and American Life Project Report: Wireless Internet Use* at 7 (July 2009), available at <http://www.pewinternet.org/Reports/2009/12-Wireless-Internet-Use/2-Online-access-in-a-multiplatform-world/1-Introduction.aspx?r=1> (noting the growth of the use of the handheld device, laptop computer, gaming console, eBook reader, etc.).

including MVPD-specific tasks,²⁴ it should not include navigation features, which likely would slow down innovation by requiring device manufacturers and other application innovators to duplicate capabilities needlessly. This approach would allow smart video devices to be developed and deployed free from particular MVPD network and technological constraints, which may limit functionality, increase costs, deter improvements, and constrain device innovation and enhancements. MVPDs, device manufacturers, and other third party innovators would have full opportunity to participate and compete in the growing device marketplace, further stimulating demand and best meeting consumer needs. As the FCC notes, this structure also could enable MVPDs to introduce new and innovative services more easily, without needing to consult navigation device manufacturers.²⁵

B. The AllVid adapter should use open, participatory, and flexible standards and create a level playing field for all device innovators.

Google believes that fostering an open and participatory standards environment that can react to technological evolution will lead to the creation of the competitive navigation device marketplace that Congress envisioned in enacting Section 629.

Open Source Standards. Google recommends that the Commission encourage, to the greatest degree possible, the establishment of license-free standards and open source technologies. The AllVid adapter solution should utilize standards and specifications developed through a transparent and inclusive process. There are real benefits that stem from the ability to select existing, established technologies, rather than inventing new ones in order to accelerate the

²⁴ See NOI ¶ 24.

²⁵ See NOI ¶ 23. Independent software vendors will be given the opportunity to compete through innovation to bring the best navigation experience, independent of the receiver used and the broadband and TV networks with which it is connected.

standardization process. Extensive experience with successful Internet technologies illustrates the tremendous success and flexibility of this approach. Google's Android initiative, an open mobile operating system that enables developers to create mobile applications that have equal access to a phone's capabilities, is only one example.²⁶ Other examples of open and participatory standards that have been successful at bringing about innovation include Ethernet cabling, WiFi (IEEE 802.11 wireless), and HTML.

Physical Connection and Communication Protocol. Certain common technologies could provide a successful open development starting point to move the AllVid concept forward and allow it to evolve over time. For example, endorsement of ubiquitous 100-BASE-TX Ethernet as the common physical layer technology used to connect adapters to navigation devices would enable compatibility with existing devices and allow for transfer of multiple MPEG-2 or H264 signals.²⁷ Further, establishing IP as the communications protocol between the adapter and consumer devices also would help guarantee connectivity with existing computer equipment, including bridges to other physical layers through, for example, WiFi, Multimedia over Coaxial Cable (MoCa), and HomePlug transceivers.²⁸

²⁶ See Android, <http://www.android.com/> (last visited July 7, 2010). Google's commitment to openness has been shown in other areas of its commercial operations, including providing a substantial investment in Clearwire and its industry-first wholesale model, participating actively in the 700 MHz auction, and helping found the Open Handset Alliance. See, e.g., Larry Alder, "Investing in the Future of the Open Internet," Official Google Blog, May 7, 2008, available at http://newsreleases.sprint.com/phoenix.zhtml?c=127149&p=irol-newsArticle_newsroom&ID=1141088; Google Press Center, "Google Will Apply to Participate in FCC Spectrum Auction" (Nov. 30, 2007), available at http://www.google.com/intl/en/press/pressrel/fccspectrum_20071130.html; Google Press Center, "Industry Leaders Announce Open Platform for Mobile Devices" (Nov. 5, 2007), available at http://www.google.com/intl/en/press/pressrel/20071105_mobile_open.html.

²⁷ See NOI ¶ 26.

²⁸ See *id.* ¶ 27.

Flexible Adapter Deployment. Deployment flexibility for an AllVid adapter is necessary for device manufacturers to be able to address the different home video configurations that exist today. For homes that access the Internet via wired Ethernet or high bitrate WiFi, the proposed gateway configuration could lower overall costs to consumers by enabling shared hardware across multiple televisions in the home, rather than replication of tuners in each room. The set-back configuration alternatively would provide consumer access via cable wiring already installed throughout the home. As such, MVPDs should be prepared to develop and provide an adapter that allows for both configurations articulated in the NOI. Moreover, the FCC should avoid encouraging technologies that would require consumer electronics vendors to undergo onerous licensing fees and certification procedures.

Straightforward and Simple Design. The Commission also should strive to ensure that AllVid adaptor design requirements are relatively straightforward. For instance, Google supports use of Universal Plug and Play (“UPnP”) protocols as a straightforward solution for service discovery.²⁹ UPnP is the most practical protocol for service discovery because it announces a gateway to consumer devices on the network and allows the network devices to browse and access all available services on the gateway. In the context of switched digital video, MVPDs should implement standardized APIs made available through the Internet.

Ordering and Billing. In Google’s view, it is neither practical nor appropriate for the Commission to attempt to standardize content ordering and billing. Instead, as suggested, the Commission should limit its role to facilitating standardization of the communication and presentation layers, and leave MVPDs and others free to reach commercial arrangements on

²⁹ NOI ¶ 30, citing Comments of TiVo, National Broadband Plan Public Notice #27 at 13, GN Dkt. 09-51 (filed Dec. 21, 2009) (UPnP is an “obvious technology choice” for service discovery).

ordering and billing, and other transaction-related issues. For example, the Commission could facilitate ordering and billing by encouraging parties to rely on established presentation technologies (*e.g.*, HTML/JS) through an open infrastructure, such as the public Internet, to facilitate the verification process.

Expanded Control and Data Exchange. FCC policies also should encompass expanded control and data-exchange for all devices. Program information must be equally available and reliable for both MVPDs and retail device vendors, including last-minute updates to program schedules and channel line-ups, to stimulate the development of new and creative navigation possibilities.

Further, the Commission should encourage standardization of a metadata stream for all video content that can be transmitted in-band with the audio and video streams that compose the program. Such metadata would include, at a minimum, closed captioning and content format information and could be used by program owners to enhance their programs with annotations for additional information (*e.g.*, news, advertising, or sports) in the form of plain text or URLs. To enhance user utility and promote innovation and adoption, there must be assurance that metadata streams, data exchanges and MVPD programming (in compressed form) are carried in full without compromised integrity between the adapter and consumer devices.

Transparency. Consumer transparency in this space also is vital. As the FCC previously acknowledged, “accurate information plays a vital role in maintaining a well-functioning marketplace that encourages competition, innovation, low prices, and high-quality services.”³⁰

³⁰ See *Consumer Information and Disclosure; Truth-in-Billing and Billing Format; IP Enabled Services, Notice of Inquiry*, 24 FCC Rcd. 11380, ¶ 5 (2009).

Consumers should have access to clear and transparent information regarding competitive retail video device options, including the costs of leasing versus owning their video devices.

C. The FCC should acknowledge the existing CableCARD role during the transition to a more open solution.

Even while actively pursuing the AllVid concept, the FCC should not ignore the embedded CableCARD base. For the time being, one-way CableCARD retail devices offer many consumers a viable device option, and are a relatively low-cost and reliable technology. As such, retention of some CableCARD rules is necessary, including those for use of CableCARD technology for MVPDs' leased set-top boxes, at least until an AllVid installed base has reached a critical mass.

In the interim, one-way CableCARD-ready retail devices – when combined with open interfaces to operate switched digital video servers, or two-way CableCARD-ready retail devices, and freed from the requirement of running the OpenCable Application Platform (OCAP) – could set in motion a more vibrant marketplace. At the same time, the Commission can transition to the more open adapter approach that will facilitate increased functionality and portability.³¹

³¹ In particular, tru2way bundles all the different functional layers: transport (MPEG, DOCSIS), presentation (OCAP), and navigation (MVPD-specific guide). Because OCAP is not HTML/JS, existing services on the Web have to be rewritten specifically for OCAP, which is exceedingly difficult for online destinations that rely on HTML/JS.

CONCLUSION

The Commission's NOI is forward-thinking and holds great promise to break the logjams that have impeded a better consumer experience. Embarking on a path of openness and transparency in the navigation device marketplace will ensure the greatest innovation and competition among devices and video services.

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