"And for too long, even as competition has developed in other parts of the communications market, the special access market has been dominated by the old monopoly telephone companies, who charge prices that are too high and use their monopoly power to block competitors from entering the market -- practices that cost consumers, businesses, non-profits, and governments billions every year."

Others said the effort is unnecessary. "Today's decision is puzzling and likely counter-productive," said Bruce Mehlman, co-chairman of the Internet Innovation Alliance, in a statement. "As the nation transitions to next generation IP-based networks and services, we all agree that advancing broadband deployment and enhancing facilities-based competition are our top priorities. Yet re-regulating yesterday's increasingly antiquated legacy network services does not seem likely to serve this imperative. Instead precious FCC resources and time get squandered on a business service whose bandwidth today fails to qualify as consumer broadband." — Kery Murakami (kmurakami@warren-news.com)

'Taste for the Extremely Obscure'

Content Providers Seen Continuing to Rely on 3rd-Party Delivery Networks

While deploying an internal content delivery network can become a viable option for large content companies, they will continue to rely on third-party CDNs, some technology experts said in interviews. Amazon and Netflix have deployed their own CDNs, and Apple's CDN is reportedly operational. As more people turn to streaming content online, more content providers will need to figure out the best route to take to keep their networks reliable, some said.

While content companies could rely, in theory, on their own CDNs, it most likely wouldn't be economical, said Doug Brake, telecom policy analyst at the Information Technology and Innovation Foundation. For companies with very large libraries of content, "it only makes sense to use an internal CDN with the very popular content," he said.

The larger the company, the more that the economy of scale would work in building out its own infrastructure, said Andrew White, vice president-technology and standards at Alliance for Telecommunication Industry Solutions (ATIS). But it's not just about how big the library is, he said. It also depends on where the distribution points are, he said. If a company is connecting across multiple operator networks to mobile and fixed users, and rural and suburban users, "it's as much about where are your peering connections and how your content gets delivered across those access networks to the end user," White said.

All Netflix streaming content comes from its own CDN, Open Connect, a Netflix spokeswoman said. By shifting to its own CDN, Netflix was able to save money, keep customer prices low and help ISPs better manage traffic on their networks, she said.

It makes sense to use an internal CDN for the most popular content, Brake said. An iOS update to an Apple device would be a prime candidate for Apple's own CDN, he said. The least downloaded song on iTunes "will likely be making it to that lone listener with taste for the extremely obscure via transit" or a CDN, he said. For this reason, and that it doesn't make economic sense for smaller companies to build their own CDN, "there will be a market for third-party CDNs for the foreseeable future," he said.
White agreed that third-party CDNs will still be needed. There are times when a customer will go overseas and try to connect, but the provider won't have coverage, he said. If a company owns its CDN, "what's the likelihood that it can deploy it to every location?" he said. "I'd expect that we would continue to need third-party CDN capabilities."

The likelihood is low of content companies relying completely on internal CDNs, said Kurt Michel, Akamai director-product marketing, media delivery solutions. Not everybody has the scale economics to warrant that, he said. "No one company has the economies of scale to deliver servers in all of the regions they may want to serve." When companies want to begin delivering outside the U.S., "they may want to use a multi-CDN strategy," he said. In one region, "they'll use their own and outside that region, they'll start leveraging something else if and until it makes economic sense to build their own CDN." It's an economically viable option for a small handful of the largest providers, he said. But those providers would continue to use third-party CDNs for various reasons, like reliability, Michel added.

Some companies want a CDN without having to build it on their own, Michel said. Akamai has software that customers can deploy on their own servers, he said. It lets companies own the CDN, while Akamai manages it for them, he said.

Traditionally, streaming services have been delivered as a "best effort service," White said. "As there's a decline in traditionally delivered linear TV services and people consume more streaming, there's going to be less patience around unreliable delivery." When that happens, there'll be a push to make sure that delivery is of high quality, he said. "Whether you can meet that across a best effort access network is an open question." — Kamala Lane (klane@warren-news.com)

**Smaller Exclusion Zones**

**Wireless Industry Urges Revisions to FCC Proposal for CBRS on 3.5 GHz Band**

Most major wireless parties continued to urge the FCC to revise the rules it proposed for a new Citizens Broadband Radio Service on the 3.5 GHz band. Replies said the major faults of the rulemaking continue to be the proposed exclusion zones and the three-tiered spectrum access system (SAS) licensing framework. The comments, posted Friday and Monday in docket 12-354, repeated concerns that parties raised in July (CD July 16 p4). Commissioners Mike O'Rielly and Ajit Pai had also raised concerns about the size of the proposed exclusion zones, in which spectrum use would be restricted to protect government incumbents, when the commission approved the FNPRM in April (CD April 24 p4).

Verizon said the proposed exclusion zones and the SAS framework don't "provide incentives to promptly deploy networks using existing technologies" and "would compromise the ability of users to deploy" in the 3.5 GHz band. Verizon urged the FCC to reduce the size of the proposed "very large" exclusion zones, saying multiple analyses show the zones can be "substantially smaller" and provide protection to incumbents. The carrier urged the commission to adopt a transitional two-tiered framework instead of the three-tiered SAS framework because necessary equipment and techniques are already available to operate under a two-tiered system, allowing for prompter investment. Verizon said it doesn't oppose increasing the power limits for general authorized access (GAA) users on the band, but said if the FCC