is no principled reason to preserve tiers, and no one has presented any actual data or expert analysis to the contrary. Accordingly, the record gives the Commission no choice but to eliminate them.

4. *Should there be a phase-in of the new VRS compensation rate or rates? How long should such a phase-in period last and how should rates be set during such an initial period? For example, should the Commission establish a three-year phase-in period, as RLSA suggests, with equal yearly adjustments to reach the new rate?*

Sorenson believes that a phase-down of Tiers 1 and 2 rates to existing Tier 3 rates should take three to five years. Any quicker phase-in to unify all rates is likely to harm VRS providers other than Sorenson. To the extent that the Commission seeks to establish new rates substantially below the $5.14 level, it should only do so over an extended period, such as five to seven years, and it should not establish rates below the level that would be anticipated to result from a two-winner competitive bid. A faster timetable would predictably devastate all VRS providers, with predictable effects on VRS users.

5. *How long should the new rate remain in effect? In the* 2007 TRS Rate Methodology Order *the Commission determined that VRS and IP Relay compensation rates should be set for a three-year period, subject to certain adjustments. In the 2010 TRS Rate Order, the Commission again adopted a three-year rate for IP Relay, but it adopted a one-year interim rate for VRS. That interim VRS rate, however, was extended in 2011 and 2012. Should the new VRS rate likewise be instituted for a three-year period, or a different period?*[90]

Finally, once reached for all tiers, the $5.14 unitary rate should remain in effect for at least three-to-five years, with annual adjustments thereafter using the normal price cap factors. As Professor Katz explains, "the shorter the review period, the closer" even an otherwise well-designed price-cap regime is "to a cost-based regime with the associated short-comings of discouraging innovation and generating uncertainty that increases providers' costs of capital."[91]

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[90] PN at 9-10 (citations omitted).

[91] Katz PN Declaration ¶ 69.

As a result, only after a three-to-five year period of stability should the Commission revisit rates to see if further cuts could then be imposed consistent with the Commission's duty to ensure the provision of functionally equivalent service.

III. The Commission Should Reject ZVRS's Proposed Central-Planning Mandates for VRS Applications Because They Would Severely Degrade the Consumer Experience, Stifle Innovation, Generate Enormous Implementation Complexities, Impose New Costs on the TRS Fund, and Violate the Commission's Statutory Responsibilities.

The PN seeks comment on ZVRS's proposals designed to prevent Sorenson from reaping the benefits of its investments in innovative, market-leading VRS equipment and applications.[92] The Commission should recognize these self-serving proposals for what they are. More importantly, the Commission should also recognize that ZVRS's approach would both: 1) harm deaf, hard-of-hearing, and speech-disabled users; and 2) violate the Commission's statutory responsibilities.

Sorenson has heard and understands consumers' frustrations with the lack of full interoperability—*i.e.,* the ability to seamlessly call point-to-point from one endpoint to another—as well as consumers' desire to be able to switch VRS providers without having manually to re-enter contact information and speed dial lists. But the Commission can address these concerns through industry standard-setting. To be responsive to consumers and the Commission, Sorenson has already been actively participating in renewed efforts along these lines.[93] By abjuring standards for a government-mandated single software platform, however, the Commission would

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[92] *See* PN at 3-4.

[93] Sorenson previously proposed equipment standards in 2008 and 2009, but they did not develop further because other providers failed to participate. *See* Letter from Gil Strobel, Counsel, Sorenson Communications, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, CG Docket No. 03-123, WC Docket No. 05-196 (filed Feb. 13, 2009); *see also* Sorenson FNPRM Comments at 66.

go far beyond what is necessary to reduce consumer switching barriers and instead destroy the engine for deaf-centric hardware and software innovation.

ZVRS's primary proposal—the imposition of a unified software-based endpoint that must be used by all providers and all users—would destroy existing incentives to innovate, introduce a hornet's nest of complexities (related to technological changes, compensation structures, and customer support), and deny consumers the right to use the products of their choice.[94] It would mark the end of the consumer-friendly, feature-rich VRS experience that has literally transformed the lives of deaf and hard-of-hearing users in recent years. As Professor Katz observes,

> "[p]reventing a VRS provider from offering purpose-built products that consumers find highly attractive would clearly benefit VRS providers that do not provide such devices, or whose devices are not preferred by consumers. But this proposal would even more clearly harm deaf and hard-of-hearing consumers by denying them choice and weakening competition."[95]

Indeed, it is no exaggeration to say that implementing ZVRS's "leveling down" proposal for VRS equipment and applications would be the equivalent—in the hearing world—of recalling *all* of the sophisticated devices and applications that hearing users now enjoy (cell phones, in-home wireless handsets, desktop work phones, and so on), and requiring everyone to go back to a rotary-dial phone designed and licensed by a single manufacturer.[96] This is truly central planning at its worst.

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[94] The other ZVRS proposal raised in the PN—disaggregating network functions and certain features from the provision of interpreting—suffers from many of the same failings and is addressed in Section IV of these comments.

[95] Katz PN Declaration ¶ 3.

[96] Professor Katz similarly likens ZVRS's radical "monopoly application" proposal to "ensuring the interoperability of mobile wireless devices by ordering all mobile wireless service providers to sell only smart phones and tablets running a new mobile operating system yet to be developed." *Id.* ¶ 12.

Setting aside the details of ZVRS's proposals, the Commission should have no doubt that they run directly contrary to the Consumer Groups' unequivocal preferences. As the Commission observed in the FNPRM, the Consumer Groups have called on the FCC "to raise the bar in technological design" and to encourage competition "to give the TRS user population a range of choices in features and services."[97] The disaggregation proposals that the Bureau is entertaining would directly undermine those core policy interests, leaving consumers with a dumbed-down, feature-poor endpoint.

But ZVRS's proposals would not only be disastrous for consumers; they would be catastrophic for the TRS Fund as well. VRS providers, and Sorenson in particular, have spent many millions of dollars developing sophisticated VRS equipment and software applications designed specifically for the deaf and hard-of-hearing market—Sorenson spent about ****BEGIN CONFIDENTIAL**** [redacted] ****END CONFIDENTIAL**** million on developing the first deaf-specific videophone alone. ZVRS's proposal would require huge outlays from the TRS Fund to design and build from scratch a far less sophisticated version of the VRS applications that providers have already developed and already support. But the expense of developing a new, less functional application is only part of the problem; retrofitting any new application to VRS providers' existing back office systems and operations would likewise impose enormous new costs and burdens on the Fund.

Significantly, however, preventing deaf and hard-of-hearing consumers—who, again, greatly value the unique features of Sorenson videophones and applications designed specifically to them—from enjoying Sorenson's innovations would not only be poor policy. On the existing record, it would also be arbitrary and capricious and would violate the Commission's statutory

[97] *See 2011 VRS Reform FNPRM*, 26 FCC Rcd. at 17,378, 81 ¶¶ 14, 21 (citations omitted).

mandate to "ensur[e] that individuals with hearing or speech disabilities have access to telephone services that are 'functionally equivalent' to those available to individuals without such disabilities."[98]

A. The Assumptions Underlying Competitors' Calls for Counterproductive Rules Governing VRS Equipment and Applications are Simply Wrong.

Before turning to the practical and legal infirmities of ZVRS's proposed mandates to prevent deaf consumers from using the videophones and applications of their choice, it bears emphasis that the reasons advanced by Sorenson's competitors for such regulation are ahistorical and incoherent. Purple, for example, has argued that Sorenson "captured its dominant market share through actions later determined by the Commission to be prohibited, including tying arrangements"[99] and unspecified "unfair practices."[100] As Sorenson set forth in its reply comments in response to the FNPRM in this proceeding, however, such claims are false, lack any basis in economic analysis and ignore the history of the VRS marketplace.[101]

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[98] *Telecommunication Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities, Americans with Disabilities Act of 1990,* Second Report and Order, Order on Reconsideration, and Notice of Proposed Rulemaking, FCC 03-112, 18 FCC Rcd. 12,379, Appendix B ¶ 2 (2003).

[99] Letter from John Goodman, Chief Legal Office, Purple Communications, Inc., to Marlene Dortch, Secretary, Federal Communications Commission, at 1, CG Docket Nos. 10-51, 03-123 (filed July 13, 2012).

[100] Comments of Purple Communications, Inc., at 7, CG Docket Nos. 10-51, 03-123 (filed Mar. 8, 2012) ("Purple FNPRM Comments").

[101] *See* Sorenson FNPRM Reply Comments at 9-17.

1. Sorenson Succeeded in the Marketplace Because it Built Better Videophones and Provided Better Service.

When Sorenson entered the market as a service provider, ZVRS's predecessor CSD and Purple's predecessor Hands On Video Relay Services, Inc. (as well as MCI's VRS operations, which became part of Purple) were already established providers of VRS services, and Sorenson had a zero percent market share. Unlike ZVRS and Purple, however, Sorenson focused on developing a videophone specifically tailored to the unique needs of deaf, hard-of-hearing, and speech-disabled users.

Sorenson's first videophone, the Sorenson VP-100®, reflected an investment of more than ****BEGIN CONFIDENTIAL**** [redacted] ****END CONFIDENTIAL**** million and was revolutionary when it was released in 2002. Sorenson also hired and trained its own interpreters—bringing a level of quality control to VRS that had not previously existed—and developed an array of enhanced add-on capabilities far beyond the minimum standards identified in the FCC's rules. The combination of unique videophones tailored to deaf, hard-of-hearing, and speech-disabled users, a higher level of interpreting quality, and enhanced features—in other words, a tightly integrated, high quality end-to-end experience—naturally attracted many users to Sorenson VRS. Clearly, however, that was a choice made by consumers; they were not obliged to take Sorenson's equipment or use Sorenson service, and could have opted for VRS offerings from other, more established providers in the marketplace. Much like consumers would later flock to Apple's iPhone over the products of other, longer-standing cell phone manufacturers, consumers *chose* Sorenson's VRS because it simply worked better and was easier to use than all other offerings on the market. Of course, the Commission has never suggested

otherwise, and certainly has never found—contrary to Purple's repeated but unsubstantiated claims—that Sorenson engaged in unlawful "tying."[102]

2. The Commission Should Focus on Advancing True Interoperability, and Neither an Off-the-Shelf Mandate Nor a Single VRS Application Will Solve All Interoperability Problems.

In addition to relying on an imagined history of anti-competitive behavior in an attempt to justify heavy-handed intervention in the market for VRS equipment and software, Sorenson's competitors have suggested that such regulation is necessary to solve interoperability problems in the VRS marketplace. ZVRS, for example, argues that transitioning "to off-the-shelf technology would end the issue of the non-interoperability of VRS provider distributed video technology."[103] The PN likewise seems to assume that a single application would solve interoperability problems, asking about such problems only in the context of whether *multiple* applications should be allowed.[104] But such assertions and assumptions are unjustified—while "[i]nteroperability is a worthy objective for VRS," ZVRS's "proposal would dramatically limit consumer choice and would go far beyond the standardization required for interoperability."[105] Moreover, it simply is not the case that mandating the use of off-the-shelf equipment or imposing a single monopoly application on VRS providers will solve all remaining interoperability problems. A comprehensive solution would also require standards for some aspects of providers' backend operations. The need for standards even in a world with just one endpoint application demonstrates that the approach the FCC suggested in the FNPRM makes much more sense:

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[102] *See* Sorenson FNPRM Reply Comments at 12-13.

[103] Letter from Jeff Rosen, General Counsel, CSDVRS, to Marlene H. Dortch, Secretary, Federal Communications Commission, at 2, CG Docket Nos. 10-51, 03-123 (filed July 13, 2012).

[104] *See* PN at 4.

[105] Katz PN Declaration ¶ 12.

develop interoperability standards for the industry under the auspices of an organization like the SIP Forum, and then allow providers to develop innovative, feature-rich and consumer-friendly endpoints that meet all of the standards.

Of course, interoperability is already required by the Commission's rules. The problem, as Sorenson's recent comments emphasized, is that "a lack of standards has made it impossible for any provider fully to meet them, and frustrated the effectiveness of those requirements."[106] Those frustrations remain particularly significant with respect to point-to-point calls—the lack of industry-wide interoperability standards makes it difficult for a deaf user of one provider's point-to-point service to connect directly and seamlessly to a deaf user of another provider's point-to-point service.

Mandating a single VRS application or the use of off-the-shelf equipment will not solve that standards problem. As further discussed below, an industry working group is now working toward SIP-based interoperability standards for VRS under the auspices of the SIP Forum. Significantly, however, SIP-based services are generally designed to work primarily in a 'routed' fashion, where endpoints register with a central component (a "Gatekeeper" in H.323 or a "Registrar" in SIP). This component is generally combined with a call routing component (a "Gateway" in H.323 or a "Proxy" in SIP) which handles all call routing for the endpoint. When a call is placed *within* an organization (or between endpoints registered with the same registrar), the call is handled between the two endpoints and the single proxy. But when a call is to be routed to an external endpoint—meaning that the registrar does not have 'local' knowledge of the endpoint, because the endpoint is not registered with it—the assigned proxy/gateway must necessarily locate the proxy/gateway that *does* have knowledge of the endpoint, and route the

[106] *See* Sorenson FNPRM Comments at 63.

call on to that proxy/gateway, which can then route to the terminating endpoint. To put the point simply, in a purely SIP environment, on a point-to-point call from one deaf person to another, application endpoints do not always "talk" to each other directly—those endpoints often connect through the components of VRS providers' communications infrastructure (*e.g.*, proxies, gateways, etc.). (And, of course, *all* deaf-to-hearing "dial-around" calls must be connected through a VRS provider's facilities.)

Within the VRS community, this call path is referred to as "server-based routing," and while it would be technically possible for SIP and H.323-based endpoints to connect directly on a peer-to-peer basis, most VRS providers either plan to migrate to server-based routing or have already done so. Indeed, it is Sorenson's understanding that all ZVRS and Purple calls use some form of server-based routing or gateway, although those companies would of course have more specific information about their network architecture. Therefore, in today's environment, very few calls between providers (either deaf-to-deaf calls or VRS dial-around) are routed strictly point-to-point, and VRS is moving toward a SIP-based architecture in which *no* calls are routed strictly point-to-point.

As a result, it would make little difference if VRS providers were to all use the same endpoint since they have deployed different backend solutions. Interoperability standards will *still* need to be in place. And since standards will be needed in any case to ensure interoperability, the Commission should support the work already underway in a SIP Forum working group that will result in competing, feature-rich, *interoperable* endpoints. There is simply no need or reason to destroy consumer choice and providers' incentives to innovate by imposing a unified endpoint on the industry.

In practice, endpoints and servers are usually "matched" by feature set and tested together to provide quality point-to-point and VRS service. For example, Cisco endpoints generally work best with Cisco servers, and Polycom endpoints work best with Polycom servers, since they are specifically designed and tested together to provide a particular feature set. As long as successful calls can be made between the Cisco endpoints and the Polycom endpoints, it doesn't matter to each call participant that their endpoint has a different set of features than the other. The important point is that they are able to use their chosen endpoint to make successful calls to other people.

Imposing a single soft endpoint by fiat would force each provider to go through the effort and expense of making that endpoint work within their own environment. And it would not resolve the interoperability problems that arise because of the use of different vendor's equipment, while industry-wide standards would.

3. Sorenson Strongly Supports Developing Interoperability Standards Through a Recognized Industry Association, as well as Standards to Ensure Portability of Consumer-Inputted Data.

In its comments and reply comments on the FNPRM, Sorenson advocated pursuing standards for the VRS industry, with a focus on interoperability, by convening a working group under the auspices of a recognized industry association.[107] In his attached Declaration, Professor Katz similarly argues that "[i]f the Commission's objective is to enhance interoperability," then the Commission should "support a process to develop and coordinate on baseline standards."[108]

Sorenson has specifically proposed establishing a working group under the SIP Forum ("the Forum") with the involvement of Neustar or a similar independent entity through which

[107] *See* Sorenson FNPRM Comments at 62-75; Sorenson FNRPM Reply Comments at 28-32.

[108] Katz PN Declaration ¶ 14.

VRS providers could coordinate documentation of standards and the required testing and transition schedule.[109] And, significantly, since the filing of comments and reply comments in this proceeding, the SIP Forum has adopted the suggestion to establish a task group to work toward identifying and adopting VRS interoperability standards. Participants in the working group—including representatives from the leading VRS providers and the FCC's Chief Technology Officer, among others—have been working toward a final charter identifying the "must have" components of the service that require standardization. The most recent version of the near final charter, dated October 31, 2012, sets forth an ambitious set of objectives for the task group, including, for example:

- Develop a comprehensive requirements document that sets forth the common network elements for the relay service.
- Specify the protocols and protocols extensions that must be supported by each element in the relay service system.
- Specify the exact RFC or other existing standards to be used.
- Specify mandatory [standards] to implement video, audio and text codecs [MUST per RFC 2119], recommended optional codecs and which entities must support them.
- Integration with systems for calling by number from national and international number plans . . . , including standards for URI registration.
- Interoperability with systems using other call control protocols.
- Emergency service calling for registered and unregistered User Agents (endpoints), including registration of device address with service provider
- Recommend minimum broadband connectivity requirements.[110]

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[109] *See* Sorenson FNRPM Comments at 66.

[110] SIP Forum Video Relay Service Task Group Charter at 3 (draft Oct. 31, 2012), available at http://sipforum.org/pipermail/vrs/attachments/20121031/9eef9787/attachment-0002.bin.

In addition to these interoperability issues, the draft also proposes that the VRS task group address specific portability matters involving customer-inputted data, including the "[i]mport and export of user phonebooks and speed dial lists."[111] Of course, as set forth in its reply comments in this proceeding, Sorenson agrees "that it should be a top priority for the VRS industry" to "move forward quickly on the development and implementation of standards and processes necessary to ensure straightforward portability of consumer-inputted data."[112]

Sorenson (along with other VRS providers and stakeholders) has been directly and actively engaged in refining the task force's charter and in helping to move the project forward. Sorenson looks forward to continuing to work with the Forum, the Commission, the industry, and interested third parties to address these issues critical to the future of VRS. As further discussed below, the work of the SIP Forum has led to far greater interoperability (including opportunities for interoperability testing and certification) for VoIP providers, and the same can and should be accomplished for VRS providers.

Against this backdrop of development of SIP standards for VRS—which will ensure full interoperability under industry-wide standards—it should make no difference to other VRS providers whether Sorenson's users employ applications and videophones designed and provided by Sorenson. As a practical matter, however, it *does* make a difference to Sorenson's competitors, because, again, Sorenson's equipment and its advanced functionalities are simply better for VRS applications than any existing off-the-shelf product. That is a big part of the reason why VRS users overwhelmingly prefer Sorenson to other VRS providers—Sorenson's equipment and software was specifically designed for the deaf, hard-of-hearing, and speech-disabled communities, and it is easier to use and provides better functionality than the

[111] *Id.* at 4.

[112] Sorenson FNPRM Reply Comments at 32-33.

alternatives. Sorenson's competitors would thus like to transition to off-the-shelf equipment and generic applications to eliminate Sorenson's competitive advantage. Plainly, however, that approach is fundamentally anti-consumer—requiring consumers to use off-the-shelf equipment made for the non-deaf mass-market will not merely render Sorenson's investments in equipment and advanced functionality worthless, but will also eliminate the benefits of those investments for deaf VRS consumers.

B. The PN's Proposals to Eliminate Customer Choice in VRS Equipment and Applications Would be a Giant Step Backwards for Consumers, and an Expensive Implementation Nightmare for the Commission.

As noted above, ZVRS's proposal—now set forth in the PN—for a "single application" for VRS is an astonishingly regressive idea.[113] Again, this approach is analogous to concluding that there are too many innovative devices available for hearing users and, accordingly, the FCC should revert to a system where just one provider makes rotary dial phones for everyone. This makes no sense—the Commission obviously should not mandate that consumers obtain and use VRS in a specific manner that is *not* what consumers *actually* choose. In that regard, it is noteworthy that Sorenson currently offers consumers *choices* that include VRS over Sorenson's innovative videophones and its equally innovative VRS software applications (or both)—but consumers overwhelmingly choose to use Sorenson's deaf-centric videophones rather than its soft endpoints running on off-the-shelf equipment. The PN thus proposes to make for consumers the exact *opposite* of the choice that they actually make every day in obtaining VRS service.

The absurdity of ZVRS's proposals does not end there. Addressing each of the detailed questions presented in the PN in turn demonstrates just how counterproductive those proposals actually are:

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[113] *See* PN at 4.

1. *The Commission proposed to establish standards for iTRS Access Technology, including VRS Access Technology, in the* 2011 VRS Reform FNPRM. *Would the process for establishing and maintaining standards discussed in the* 2011 VRS Reform FNPRM *be appropriate for developing an application or establishing standards for an application? Should the application or key components thereof be open source?*

The PN's first question addresses *how* to develop a single VRS application, but that is the wrong place to start. The proper place to begin an inquiry into the possibility of a single VRS application is *whether* doing so would be a good idea. Before addressing the specifics of Question 1, it makes sense to briefly summarize several key reasons why the answer to that logically prior question is a resounding "no."

First, even if a single application running on off-the-shelf equipment could solve the point-to-point interoperability problem, the cost would be a severe degradation in the quality of VRS service. That is because off-the-shelf equipment simply cannot provide the quality of VRS experience that consumers have come to expect from dedicated VRS videophones. Again, as noted above, consumers choose deaf-centric Sorenson videophones for the vast majority of calls that Sorenson handles. And that is no surprise because those videophones, by definition, are specifically designed for the deaf and hard-of-hearing population. In contrast, off-the-shelf equipment (like iPads, smart TVs, and videophones for video conferencing, for example) were designed for the hearing world and hearing applications, and they prioritize different technical demands. As a notable example, equipment and applications for hearing individuals (and thus equipment designed to run those applications) sacrifice the quality of video to ensure high-quality audio in communications settings. Thus, for example, off-the-shelf equipment is not optimized for high frame rates to capture the highly nuanced motions of ASL—but that kind of crystal-clear transmission is critical for ASL users.

Frame rates, however, are just one example of how off-the-shelf equipment for the hearing mass market does *not* meet the demands of VRS. A functionally equivalent VRS experience also includes:

- Visual ringing, including purpose-designed compatibility with household light flash systems;
- Integrated 911 address provisioning;
- Access to 911 even when the device is not connected to a service;
- Amplified audio;
- Integration with large screens for easier reading of ASL;
- Color and user-interface design for those with the addition of visual impairment;
- Integration with video mail; and
- Integrated support for voice carryover service.

Moreover, purpose-built videophones are always dedicated to providing VRS; off-the-shelf multi-function devices, by contrast, will go into hibernation modes to save power and can shut down applications without notice, which means users miss calls without even realizing that their endpoint application is not running. Equally, manufacturers of off-the-shelf enterprise video products have little economic incentive to meet VRS feature and cost-point requirements because the market for deaf-centric equipment is tiny compared to the mass market for hearing individuals.

Enterprise video conferencing solutions are, moreover, expensive products with short lifespans. For example, Cisco recently announced the end of its E20 video conferencing device with no pending replacement, and this follows an equally short lifespan for Cisco's E150 device. Other vendors, like Creative Labs, have stopped building video conferencing products altogether because they were not commercially viable, and Lifesize and Polycom both have products that are priced at daunting enterprise price points—a particular problem given that equipment expenses have not been considered "allowable" by the Commission.

Multifunction devices, like iPads, share the shortcomings of enterprise videoconferencing solutions in the VRS context, and present others as well. In particular, as the "multifunction" description suggests, those devices are often used for other tasks. In other words, if a deaf or hard-of-hearing user's son is playing Angry Birds on the iPad, that device may not be available as a practical matter for a VRS call. This problem is far less significant in the context of the dedicated endpoints that many deaf and hard-of-hearing consumers currently employ. Indeed, many VRS users have such a strong preference for dedicated equipment that their living rooms contain two televisions side-by-side—one for VRS, and one for other uses.

Another reason to reject moving to a single, unified application out of hand is that it would need to be based on a "lowest-common-denominator" approach to existing VRS systems. In other words, a single soft endpoint would not work with all providers' systems unless its functionality were extremely basic, devoid of virtually any feature beyond transmission of video. This would be an enormously regressive approach to VRS applications, and would render the service essentially unrecognizable to those who have come to rely on it.

Finally, and perhaps most importantly, replacing the rich variety of VRS equipment and applications currently available to consumers with a single application will utterly destroy incentives for continued innovation. But developing and implementing interoperability standards—as the FCC proposed in the FNPRM—would preserve those incentives and the enormous benefits they deliver to consumers. Once VRS interoperability standards are in place, it should make no difference what VRS endpoint an end user chooses—all physical videophones and applications will be interoperable, assuming conformity to the standards in place and adequate interoperability testing. This problem is further discussed in connection with Question 2, below.

Turning to the specific sub-questions of Question 1, the process for establishing and maintaining standards discussed in the *2011 VRS Reform FNPRM* certainly would *not* be appropriate for developing a single, standard VRS application. Appendix B of the *2011 VRS Reform FNPRM* suggested that the standardization process should be "undertaken by VRS providers and equipment suppliers under the umbrella of an existing organization open to such members and dedicated to interoperability, in which a Working Group focused on VRS can be established."[114] As discussed above, precisely such a working group is convening under the auspices of the SIP Forum to address interoperability issues in conjunction with industry participants and other interested parties. The SIP Forum has a history of solving difficult interoperability standards problems, including most recently standards for SIP Trunking. This working group on interoperability is the perfect place to document standards and troubleshoot VRS SIP interoperability. The SIP Forum already includes models for interoperability testing through its SIPIT events.

The standards working group is entirely the wrong place to develop software, however. That would be like getting a working group together to develop an application to replace any other highly sophisticated piece of software, say iTunes or Microsoft Word. Developing VRS software requires an enormous depth and breadth of resources—including time—that simply is not available to a working group.

A working group can reliably establish standards for SIP-based communications, which will include SIP infrastructure and endpoints. But "establishing standards for an application" alone would not be time well spent. "Standards for an application" will not ensure interoperability because the application alone is not the problem. Again, the problem also stems

[114] *2011 VRS Reform FNPRM*, Appendix B ¶ 21.

from the fact that VRS providers need to implement a set of standards for the *entire communications path* that lies between two applications being used for point-to-point communications.

Finally, the question of whether a single VRS application should be "open source" is a red herring. The real issue is whether there should be a single application to begin with—and there should not. If the Commission were to demand that all VRS consumers employ a single VRS application, however, such an application should be open source. But any flexibility gained by having an open source application would pale in comparison to the enhanced functionalities that consumers would lose if forced to abandon providers' existing, highly sophisticated VRS applications—not to mention the feature-rich dedicated videophones that consumers overwhelmingly prefer to soft endpoint applications.

2. *Should the Commission mandate use of a single application or allow development of multiple, interoperable applications? Who should be responsible for application development? For example, should the Commission develop, by contract, such an application? How should the developer of the application be compensated?*

Like the first question, the second contains assumptions that are simply wrong. The question assumes that the *Commission* should decide what choices consumers have to access VRS. But, of course, that is incorrect—VRS consumers themselves are best equipped to determine what kinds of equipment and applications provide the best VRS experience. And, as discussed above, consumers overwhelmingly choose Sorenson's dedicated videophones, because applications on equipment that has not been specifically designed for use by the deaf cannot come close to the experience that consumers have come to expect from Sorenson.

The answers to the first two sub-questions here are thus that VRS providers should be responsible for application (and videophone) development in direct response to consumer preferences, and the Commission should of course permit the development of multiple

applications. As the Commission has acknowledged, it is the offering of VRS products "on a competitive basis" that "encourages innovation," thereby benefiting consumers.[115] Indeed, *only* by permitting competition among VRS providers to supply consumers with the best possible VRS experience will continued strides toward the "functional equivalence" demanded by statute be possible.[116]

There are a variety of reasons why it would make no sense for the Commission to attempt to "develop, by contract" a standardized VRS application. As a practical matter, the Commission itself does not have the expertise necessary to specify the particular functions and features that deaf and hard-of-hearing users demand in a VRS application, or to troubleshoot and otherwise evaluate the usability and overall quality of any proposed application. And the software developers with the necessary expertise to design, create, and refine VRS applications are, of course, the professionals within the VRS industry who have been working on such applications for years. A third party would simply lack the industry experience necessary to develop a solution that actually serves the needs of deaf and hard-of-hearing users.

Nonetheless, as a practical matter, the developer would *need* to be an industry outsider—notwithstanding that it would be difficult or impossible to find any third party qualified to take on the job of creating a single, unified VRS application. That is because, as part of the development process, VRS providers would need to make critical network and back office information available to the developer so that it could generate a solution that works with their systems. But VRS providers would be enormously resistant to providing such critical

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[115] *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, Second Report and Order and Order on Reconsideration, FCC 08-275, 24 FCC Rcd. 791, 820 ¶ 63 (2008) ("*2008 VRS Report and Order*").

[116] *See infra* at Section III.C.

information to a competitor in the industry, or even giving such information to a third party that might, even inadvertently, share such proprietary information with other VRS providers.

Even assuming that a third party could obtain the information it would require to move forward with development, the end result—as discussed above—will by definition be a stripped-down endpoint that reflects lowest-common-denominator attributes of different VRS providers' systems so as to allow the application to work across all of their platforms. More advanced features could not be supported through all of the disparate back end systems the VRS providers have developed. Even relatively basic features like video mail, for example, could not be implemented in an endpoint that would work on all providers' platforms without sacrificing existing functionality.[117]

The work of developing even a generic application that would work on all providers' platforms—and all existing and future off-the-shelf platforms—would also be enormously expensive, as the developer would need to understand all of the VRS providers' operations intimately to develop a solution that would work with all of them. That expense would then be further multiplied as providers worked to retrofit their back office operations to enable them to interact meaningfully with the generic application. The overall result would be a hugely expensive development effort (with a major impact on the TRS Fund), all to produce an utterly underwhelming endpoint devoid of features.

The question of how to compensate the developer is an intractable one. There is no good answer because no compensation system will provide what is critically needed: an incentive to

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[117] *See* Letter from John Goodman, Chief Legal Officer, Purple Communications, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, Attachment at 3, CG Docket Nos. 03-123 and 10-51 (filed Oct. 4, 2012) ("Technical standards foster a more competitive environment, enhance consumer choice, and give providers ability to reach scale.").

keep innovating. This is, of course, the fundamental problem with central planning—without competition, no one has any incentive to continue to innovate and improve services, leading to the kinds of well-documented failures that government-run monopolies have experienced around the world.

Unfortunately, this incentive problem is not limited to innovation—applications must also be continually updated to work with new equipment and operating systems, and to continue to function on older equipment even as it becomes outdated. Is the government really going to decide whether to support a new off-the-shelf vendor's operating system, or even one that is newly revised? If Blackberry, Nokia, Apple, Google, or Microsoft brings out a new operating system for new mobile products, will those products remain unavailable to VRS users until the government or its chosen application developer decides to have the VRS application developer produce a compatible version? Apple, for example, has released two new platforms in the last quarter with new and different screen sizes. If the Commission were to mandate a single soft endpoint, would the developer be required to support these new devices (and, if so, how quickly)? Adding Android-based devices to the mix makes the problem even more complicated. There are three different versions of Android that are common in the marketplace, with dozens of popular devices using them—each with their own screen sizes, camera designs, and customization. It is difficult to imagine that a government-administered endpoint development project could match the constant speed of the change in these devices and operating systems.

And how could any compensation scheme provide appropriate incentives for a third-party developer to keep software up to date, let alone to improve it over time? In short, regardless of whether a developer is compensated by a fixed fee, per minute, or with a per-subscriber license fee, the Commission would need to address the reality that the developer's job is never really

complete, but rather the developer must continually update the application as equipment evolves, as the Commission implements new rules that impact endpoint operations, and as standards-setting bodies and working groups issue standards applicable to the endpoint.

The compensation problem is further complicated by the fact that a software developer will also need to provide customer support for the application. Once again, however, it is difficult to see how to provide an incentive for quality customer service—after all, once the developer has released the application and been paid, it really does not matter to that entity whether customers are satisfied or not. Perhaps some kind of per-minute compensation could address this problem, but it would not give the developer any incentive to both develop a bug-free product and also fix errors that inevitably will occur. And there is no doubt that a third-party application will open the door to all sorts of uncertainty and disputes about whether the developer or the VRS provider is responsible for service problems experienced by the end user. Moreover, the duplicative service staffs required by the developer and VRS provider will obviously increase costs to the TRS Fund.

Compensation for the developer also raises thorny questions about the rest of the VRS compensation regime. Considering that equipment costs are not currently "allowable" for purposes of VRS rate-setting, the stand-alone developer's compensation should not have any impact on VRS providers' compensation. But that means that the developer's compensation would be entirely *new and additive* costs for the TRS Fund. If the Commission wished to reduce VRS providers' compensation to cover the developer's fee, it would need to articulate a reasonable justification (which seems elusive since these costs are not included in the calculation of VRS providers' rates anyway)—and it would then need to tackle the thorny problem of entirely recalibrating a VRS compensation rate that has already been in the works for years.

The existing system, of course, avoids all of those issues. Providers have strong competitive incentives to develop state of the art applications and videophones, to improve them regularly, to update them along with upgrades in off-the-shelf equipment, and to provide thorough consumer support for the entire user experience.[118] Eliminating the current competitive landscape would destroy innovation and the customer experience. Sorenson suspects that, as a practical matter, it would take years to recreate the current innovative and consumer friendly landscape when, after implementing a proposal of this kind, the FCC realizes the enormity of the harm it creates.

3. *Should providers be able to continue to offer their own internally developed applications? If so, under what conditions? For example, should there be an interoperability testing process? How would such an interoperability testing process be structured?*

Providers should certainly be permitted to continue to offer their own VRS applications. As noted above, the Commission has itself correctly observed that competition among providers to produce the best equipment and software is what spurs innovation and benefits consumers. There is no reason, however, to limit VRS providers to producing only software, as opposed to deaf-centric videophones. Deaf and hard-of-hearing consumers overwhelmingly prefer dedicated videophones to VRS applications running on off-the-shelf equipment, and relegating those consumers to a far lower quality VRS experience makes no sense. Interoperability issues, as discussed above, should instead be addressed through the adoption of appropriate standards.

Sorenson recognizes, however, that while adopting standards will go a long way toward resolving interoperability problems, those standards must also be respected industry-wide. Sorenson accordingly supports the evolution of today's *ad hoc* provider-to-provider

[118] *See also* Katz PN Declaration ¶ 3 ("CSDVRS's proposal to create a monopoly-franchise VRS application would deny choice to deaf and hard-of-hearing consumers, stifle innovation, and create a host of administrative problems.").

interoperability testing into a more formalized process under the auspices of a recognized industry association like the SIP Forum. The FCC should be at the forefront of encouraging an open, consensus-based standards development process, as it was for SIPconnect in the context of VoIP.[119] The SIP Forum launched a SIPconnect Compliant Certification Program in 2007,[120] and in 2012 introduced a new SIP trunking interoperability testing initiative to drive industry-wide adoption of the SIPconnect 1.1 Technical Specification. At a five day event in early December 2012, the University of New Hampshire's independent Interoperability Laboratory will provide a venue where attendees can perform technical interoperability testing among and between products or services that use the SIPconnect 1.1 Technical Specification published by the SIP Forum.[121]

Sorenson expects that the SIP Forum working group on VRS standards could similarly provide a process for interoperability testing in the VRS context. Plainly, if the same energy currently devoted to attempting to undermine Sorenson's investments in innovative VRS equipment and applications were put toward actually resolving remaining VRS interoperability issues, those issues would already either be solved or well on their way to resolution.

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[119] *See, e.g.,* SIP Forum, SIPconnect, at http://www.sipforum.org/sipconnect (last accessed Nov. 12, 2012).

[120] *See* SIP Forum, SIPconnect 1.0 Complaint Application, at http://www.sipforum.org/content/view/290/247/ (last accessed Nov. 12, 2012).

[121] *See* SIP Forum, SIPconnect-IT 2012 Overview, at http://www.sipforum.org/content/view/400/288/ (last accessed Nov. 12, 2012).

4. *Should the application be fully executable, or a core executable or set of libraries ("core") that can be customized by interested parties (e.g., using published APIs), or both? If core, what key functions should this core contain such as video encoding, video deciding and session signaling? If core, should there be a certification process before calls placed with the application are compensable? How should that process be structured? Who should be responsible for maintaining and updating applications?*

Once again, this question is based on assumptions with which Sorenson vigorously disagrees. Neither a single, fully executable application nor a single set of "core" libraries customizable by interested parties makes sense. Simply put, both approaches would require providers to discard the enormous investments that they have made in equipment, VRS applications, and back office operations and networks tailored to those provider-specific endpoints. Both approaches would thus impose enormous industry-wide expenses—both for the development of a lowest-common-denominator, plain-vanilla endpoint that can function on every provider's platform, and for the reconfiguration of many aspects of providers' operations that would be necessary to enable even the most generic of applications to operate on the providers' systems. This is, as discussed above, a ridiculously inefficient way to attempt to achieve full interoperability, and it is ultimately certain to fail.

The question of who should be responsible for updating and maintaining a single, unified VRS application—to say nothing of continuing to improve it over time—is, as already discussed above, one of the more critical problems for the PN's proposals. Replacing competition with central planning is a recipe for disaster not only with respect to innovation, but also in connection with ongoing service (updating and maintenance, as well as customer service) required by the unified application. Whoever develops the application will be best positioned from a technical perspective to update and maintain it (and to provide customer service on it), but that entity will need to be paid to do so. Yet it will be difficult or impossible to design a compensation regime that provides appropriate incentives, and even if such a regime could be