

STUDY OF VOICE OVER INTERNET PROTOCOL SERVICE - BACKGROUND MEMORANDUM

STUDY OVERVIEW

Section 1 of 2013 Senate Bill No. 2234 (attached as an [appendix](#)) provides for a Legislative Management study of Voice over Internet Protocol (VoIP) service and the effect of this service and other technologies on the telecommunications industry. The study is to include consideration of changes in regulation and taxation. The responsibility of this study was assigned to the Information Technology Committee.

BACKGROUND INFORMATION Voice over Internet Protocol Service

Voice over Internet Protocol service is a method of delivering voice and data communications over the Internet. Initially, telephone calls and data transmissions, such as telegraphs and faxes, required a dedicated line between a sender and receiver. As technology improved, multiple calls or data transmissions could be sent along the same line. Companies developed a system of collecting incoming transmissions from senders at switching stations, funneling them onto a single line, and then redistributing them at other switching stations to the proper recipient. This system became known as the public switched telephone network (PSTN). Prior to the Internet, the primary method for transmitting messages was time-division multiplexing (TDM). In TDM, the message is broken down to fit into timeslots and is transmitted during specific time intervals. This process happens hundreds of times per second.

With the introduction of the Internet, a new method of transmitting messages developed called Internet Protocol (IP). Internet Protocol is a type of packet-switched network, in which messages are broken down into packets of data based on size. This new method of transmission provides a more efficient use of transmission lines allowing for more data and faster transmission speeds. As the Internet and Internet applications expanded, companies developed methods of integrating telephone messages into the IP network. This integration became known as VoIP, and it allowed telecommunications companies to bundle their services into a single transmission line. Both TDM and IP are in use today, but many telecommunications companies are in the process of upgrading their networks to use IP.

Although TDM and IP are methods of sending data over transmission lines, each method requires a different set of equipment, particularly at switching stations. Telecommunications companies can send messages using either method over existing copper wire, fiber optic cables, and other transmission mediums; but the companies must replace the TDM-compatible switches at switching stations with new routing equipment to accommodate the transition from TDM to IP. The initial cost of equipment replacement requires a major investment for telecommunications companies; but once established, companies can experience reduced expenses through efficiencies and increased revenues by providing new services.

North Dakota Century Code

North Dakota Century Code Section 57-40.6-01(15) defines VoIP service as a service that enables real-time two-way voice communications, requires a broadband connection from the user's location, requires IP-compatible customer premises equipment, and permits users generally to receive calls that originate on the PSTN and to terminate calls to the PSTN.

Chapter 57-40.6 provides regulations for emergency services communications systems, which apply to telephones using the PSTN and phones using VoIP. These regulations help to ensure all telephone users may contact emergency services.

ISSUES RELATED TO VOICE OVER INTERNET PROTOCOL SERVICE 911 Services

Traditional landline telephones associate a specific telephone line with a specific address allowing public safety authorities to identify the location of a caller. The location of a mobile phone user can be identified through the global positioning system in a phone or through signal triangulation. VoIP phones transmit messages over the Internet, and the location of the caller cannot always be determined. If a VoIP phone is interconnected to the PSTN, users must register their location with the VoIP provider so the information is available for public safety authorities. If a user does not provide the correct information or changes locations, the public safety authorities cannot verify the caller's location.

In the event of a power or Internet outage, landline telephones and mobile phones usually maintain service; however, a VoIP phone will not have service if an Internet outage occurs, because the messages are transmitted

using the Internet. A VoIP phone will not work during a power outage unless there is a battery backup for the modem that connects the phone to the Internet. Some individuals have expressed concerns about the reliability of VoIP service, particularly during severe weather and emergency situations.

When VoIP service was initially available, VoIP service providers did not always collect and remit fees to political subdivisions for emergency services communications systems. The Emergency Services Communications Coordinating Committee 2012 report indicates at least 16 VoIP service providers now collect and remit the appropriate fees.

State and Federal Regulation

Traditional telephone service on the PSTN has been regulated by the Federal Communications Commission (FCC) since 1934, but regulations for VoIP are still being developed. Regulating VoIP is complicated by the different types of VoIP service, such as phone-to-phone, computer-to-computer, and computer-to-phone. Since VoIP calls travel across the Internet, calls may be routed through switching stations located hundreds of miles away in another state. As a result, the FCC has been the primary regulator for VoIP. State regulation has generally been limited to emergency services communications and consumer protection. State and local governments retain the ability to collect taxes and fees from companies that provide VoIP services.

Recently at the request of telecommunications companies, some states have passed legislation to prohibit VoIP and IP service regulation at the state and local level, essentially providing VoIP and other IP services will be regulated only at the federal level. As of October 2012, 24 states--including California, Texas, Wisconsin, Illinois, and Indiana--passed legislation to limit state and local regulation of VoIP services. Telecommunications companies assert this type of legislation provides stability as they invest in infrastructure upgrades.

2013 Legislative Action

As introduced, Section 1 of 2013 Senate Bill No. 2234 provided a state entity or a political subdivision may not regulate VoIP or IP services. Sections 2 and 3 provided definitions of IP and VoIP, respectively. The Senate Industry, Business, and Labor Committee amended 2013 Senate Bill No. 2234 to remove Sections 1 through 3 and to provide for a Legislative Management study of VoIP services, including any recommended changes in taxation and regulation. The 2013 Legislative Assembly approved Senate Bill No. 2234 as amended to provide for a study of VoIP services.

STUDY PLAN

The following is a proposed study outline for the committee's consideration in its study of VoIP service:

1. Receive and review information regarding telecommunications services and regulations within the state.
2. Receive and review information regarding VoIP services and regulation within the state.
3. Receive and review information regarding VoIP services, regulation, and best practices in other states.
4. Receive and review information regarding regulations to provide emergency services to VoIP service users.
5. Receive testimony from interested persons regarding the committee's study of VoIP service.
6. Develop recommendations and any bill drafts necessary to implement the recommendations.
7. Prepare a final report for submission to the Legislative Management.

ATTACH:1