DECLARATION OF WILLIAM H. STONE

1. I am Executive Director of Network Strategy for Verizon, and in that capacity I am responsible for advanced technology planning for Verizon Wireless, including new technology assessments, development of network evolution plans, participation in industry standard groups, and spectrum planning. I have been directly involved in the planning and deployment of Verizon Wireless' current broadband services – Ev-DO Rev A and LTE – and the network infrastructure to support those services. In particular, I have been responsible for assessing the company's ongoing spectrum capacity needs and identifying additional spectrum that can meet those needs both in the short term and over the longer term.

2. During my 23-year career in the wireless industry, I have served in a variety of network leadership positions where my responsibilities included network planning, engineering, and system performance. I have appeared on numerous wireless industry panels and programs concerning network evolution and spectrum. I have also testified at two FCC workshops: the National Broadband Plan Workshop on Spectrum in September 2009, and the Workshop on Technical Issues Related to 700 MHz Interoperability in April 2011.

3. I submit this declaration in support of an application to the Federal Communications Commission in which Verizon Wireless seeks approval to acquire 122 Advanced Wireless Services (AWS) licenses from SpectrumCo, LLC.

4. In brief, the spectrum covered by these licenses will enable Verizon Wireless to add needed capacity to its network, and thus help address in part the rapidly growing demand for wireless services, particularly broadband. This demand shows no signs of slowing – to the contrary it is accelerating, as more and more customers rely on wireless services for their broadband needs, buy more devices that access the Internet, use those devices more hours each

day, and download more and more applications that use large amounts of bandwidth. While the spectrum we will obtain from SpectrumCo is necessary to help meet the need for more capacity in various markets, Verizon Wireless will continue to need additional spectrum, in these markets and others, to cope with what we expect to be a continued surge in wireless broadband usage in the years ahead, as the development of new uses and applications shows no signs of abatement.

5. Initially in this declaration, I will discuss the key trends that are driving accelerating data demands on the Verizon Wireless network. Next, I will discuss practical challenges we face in projecting future demand and ensuring that our network has sufficient capacity to meet those demands. Finally, I will explain the process we use to assess future spectrum needs and how AWS spectrum will help to meet those needs.

6. ***Customer Trends Are Driving Growing Network Capacity Demands.*** Our spectrum planning demonstrates that Verizon Wireless will need this and other spectrum due to four trends in how our customers use wireless devices and services and access our network. All of these trends compound each other and drive our need to obtain additional spectrum.

(1) The volume of data traffic on our network has been nearly doubling every year and the pace of growth has been accelerating. I often refer to a "hockey stick" shaped growth curve for network data traffic demand, meaning that we are seeing not only increasing use but the pace of that growth is accelerating. While voice traffic has continued to increase, data usage on our network has been growing by double-digit figures every quarter, and is placing the most significant incremental demand on our network capacity. From 4Q06 until 4Q11 we have experienced a compounded annual data traffic growth rate of approximately 94% year over year, meaning that data usage has nearly doubled each consecutive year for the past five years. Over the past two

years that rate of growth has exceeded 100%, meaning that it has more than doubled each year. This implies a nearly 30-fold increase in data traffic over the past five-year period. Our LTE usage projections suggest that this trend of doubled data usage every year will continue, and that traffic on our LTE network will surpass data usage on our Ev-DO network in early 2013.

(2) Many more devices use our network, and that figure is growing faster than the number of individual customers, because more customers are using multiple devices. While only a few years ago most customers had only one device and used it to make voice calls, today many of our customers have two or more devices, which can include a data card for connecting laptops or PCs, a smartphone, a netbook, a tablet, and/or a mobile hotspot that provides WiFi connections for multiple devices. As a result of this trend, we now typically report total users in terms of "connections," which represents the number of devices that our customers own and use to access our network. That number has grown steadily every year. At the end of 3Q11, the company served 107.7 million connections, an increase of 6.5% over 3Q10, consisting of 90.7 million retail and 17.0 million wholesale and other connections. Further expansion into the machine-to-machine ("M2M") space, which is still embryonic, will fuel continued growth in the number of overall connections. This growth alone puts increasing demand on our network and its spectrum resources.

(3) The mix of devices is shifting toward more bandwidth-intensive devices. Customers are changing their preferences for devices in favor of smartphones and other broadband capable devices. Each month, a greater percentage of the devices our customers use are essentially mini-computers that can access the Internet and engage

in a wide variety of other uses of broadband services. While 24% of our postpaid customers had smartphones as of 3Q10, that percentage grew dramatically in just the next year, reaching 39% in 3Q11 and we expect that relatively soon more than 50% of our customers will have smartphones. We sold 5.6 million smartphones in 3Q11 alone, and fully 60% of postpaid phone sales were smartphones. This too drives up network demand, because customers' use is shifting rapidly toward more broadband data services to benefit from the growing number and variety of applications – there are more than a million apps for the iPhone alone.

(4) The types of data usage are becoming more spectrum-intensive. While several years ago accessing 'static,' text-based websites was the predominant form of data usage, today many websites are dynamic, featuring bandwidth-intensive video and other features. And, an increasing number of customers use their devices to access video programming and VOIP applications with video capability. They are also downloading feature-rich applications which themselves place greater demands on the network's capacity. These services consume anywhere from 5-10 times as much bandwidth as accessing a website. As customers use their devices for accessing these high-bandwidth applications and features, our network is experiencing markedly increased capacity demand. That trend is intensified because customers are also increasing the amount of time connected to the network. They are spending more and more time using data services for social networking, to explore video/music content, to use navigation applications, to play interactive games, and to browse the web. Customer habits have evolved so that many customers' personal and business lives

rely on being connected to data rich services while they are on the move throughout the day.

7. ***The Practical Challenges of Meeting Growing Demand Make Acquiring More Spectrum Essential.*** Five other challenges we face make it even more important to increase our network capacity to meet future demand through additional spectrum purchases such as this transaction.

8. First, with data, unlike with voice or text messaging, speed is an increasingly important consideration for customers. Their demand for high-speed services in turn requires substantial bandwidth. These higher speeds in turn drive additional data usage on the network. As an example, an LTE device on average has approximately two times the monthly usage as a comparable Ev-DO device. Carriers continually strive to achieve (and regularly promote) the speeds at which customers can access the Internet and run applications. Speed and capacity, however, are directly related – high-speed services demand substantial bandwidth. In short, we engineer our network not only to provide customers with a quick and reliable connection, but with access speeds through that connection that are designed to achieve the goals we set for data services – for Ev-DO, typical download speeds of 600 kbps – 1.4 Mbps and upload speeds of 500-800 kbps; for LTE, typical download speeds of 5 – 12 Mbps and upload speeds of 2 – 5 Mbps.

9. Data networks manage customer usage differently from voice networks. For example, on a voice network, a single cell site might be able to handle 100 calls simultaneously. The 101st caller will not be able access the network until one of the first 100 ends the call. In contrast, networks handle increasing data demand by dynamically managing speeds. Thus, if there are 100 customers using a data connection via the same cell site, the 101st customer will get

a data connection, but all 101 customers will see slightly diminished speeds; the more customers join, the more speeds decline. To maintain the same speeds that customers grow to expect as the norm, more spectrum capacity must be added. For this reason, providing the speeds we want to supply our customers requires that we provide steadily increasing spectrum capacity as the number of data customers – and the length of time they are using their connection – both continue to increase. Maintaining these typical speeds across our network, particularly as customers use more and more bandwidth-intensive applications, will require additional spectrum resources, part of which can be met by this transaction. Maintaining quick, reliable connections that achieve expected access speeds is critical to meeting customers' expectations.

10. Second, our experience has been that our previous projections have understated actual growth in traffic. With the acceleration of data demand, slight variations between projected and actual use can have substantial impact on spectrum needs. Moreover, because data has been a significant component of usage for only a few years, we have a relatively short history of experience from which to extrapolate future usage. For example we have doubled our 4Q11 data traffic forecast compared to the original forecast created in early 2009, and we have revised upward our 4Q15 forecast by approximately seven times.

11. One constant in the wireless industry over the past two decades has been that forecasts have been routinely surpassed. Given the adverse impacts on our customers should we become spectrum constrained in any market, our spectrum planning needs to build in a margin of error to account for the real risk that actual demand will be higher than we project. One example underscores this point. Verizon Wireless has tested a device, the Cantenna, which is an LTE fixed antenna that attaches to a customer's house and brings broadband into the house via our LTE technology. Because marketing of this service is only in the planning stages, it is difficult

to predict the impact of the service on demand. However, because the service will enable customers to watch video, download movies and be on the Internet for long periods of time from their home computers, it could contribute substantial usage to the LTE network. Of course, this is just one example of the types of services that may be offered going forward, and of the additional demands that may be placed on our network as consumer demand, services and products continue to evolve.

12. Third, it takes a long time, even once spectrum is acquired, to put that spectrum to use. Since spectrum resources are not immediately available when the need occurs, the reality is that we must secure spectrum today when it is available, for needs that are years away. Verizon Wireless looks at spectrum needs not merely on a short-term (1-2 years) time frame but also on a longer term (3-7 years) time frame. Just as it is important while driving to look not only at the road directly in front but also down the road ahead, forward-looking, long-term spectrum planning is essential because there are long lead times needed to complete the many steps that can be required before new spectrum is put to work.

13. To illustrate why there needs to be significant time between when spectrum is acquired and when it can be put to use, we typically must complete some or all of the following actions before spectrum is fully put to use: (1) complete the RF design, which essentially determines the most efficient way to deploy cell sites and antennas on those sites to cover the desired area with the desired signal level, (2) work with our network infrastructure vendors to design and build base station equipment and antennas, (3) work with our OEMs to design and produce mobile devices, (4) negotiate with landlords to acquire space on existing towers or to acquire new site locations – a process which often consumes six months or more, (5) complete the permitting process which is necessary for many sites, even when it involves merely

collocating additional antennas or replacing existing antennas, (6) deploy the equipment at the sites, (7) obtain and install backhaul facilities to connect new sites to our core network, which can require additional zoning approvals and negotiations with backhaul providers if we do not self-provision, and (8) test and fine tune the network to ensure it performs optimally and meets our performance specifications. In short, it may take two years or longer to deploy spectrum we acquire today. We thus need to acquire spectrum today to prepare for demand that is years out.

14. Fourth, while we constantly look for ways to use spectrum in the most efficient manner, these tools by themselves are not sufficient to meet our growing capacity needs. We already serve more customers per MHz than other national carriers. We have a national average spectrum depth of 88 MHz, which we use to serve 107 million connections, or more than 1.2 million connections for every 1 MHz. While we can sometimes use cell splitting to meet increased demand, the benefits of that technology are limited. As we place more and more sites close together, the benefits of additional sites decline, particularly relative to the zoning, equipment, construction, and other expenses necessary to deploy more sites. The costs of deploying additional sites are also substantial. Finally, LTE is the most spectrum-efficient air interface technology available today. In short, techniques to enhance the efficient use of the spectrum we currently hold cannot alone meet the accelerating demand for more network capacity.

15. Fifth, going to the secondary market to address future spectrum needs is particularly necessary, because the Government has not made additional spectrum blocks available for mobile wireless services though spectrum auctions since the 700 MHz auction – an auction that concluded nearly four years ago. Although demand for wireless networks has been growing exponentially, the Government has not brought any "new" spectrum to market. Moreover, there

is no imminent spectrum auction that Verizon Wireless can look to in order to meet its growing spectrum needs. But even were the Government to identify suitable spectrum in 2012, it would (based on past history) take several years to bring it to auction. Even more problematic, with many potential blocks of spectrum, significant issues would need to be resolved to clear incumbent users, further delaying potentially for years the full utility of that spectrum. In short, Verizon Wireless has determined the only path it has to meet its growing spectrum needs is to go to the secondary market.

16. While the SpectrumCo licenses will help to meet the growth in our customers' demand for wireless broadband in the near term, we fully expect that we will need additional spectrum in the longer term. This is why Verizon Wireless has fully supported the Government's target of identifying and licensing 500 MHz of additional spectrum over the next ten years. Making substantial amounts of spectrum available to meet growing demand that we fully expect will continue for many years into the future is absolutely essential to ensure the public can continue to benefit from state-of-the-art wireless services.

17. ***Spectrum Planning Shows More Spectrum Is Needed to Serve Customers.*** Verizon Wireless, like other carriers, must constantly assess whether it has sufficient spectrum to meet the needs of its customers, because spectrum is the raw material for all of its services. Calculating spectrum needs is more of an art than a science – it depends on many variables and we cannot precisely determine the point at which spectrum resources will become constrained. In fact, as noted above, data traffic has grown faster than our previous projections.

18. Moreover, capacity demands are not uniformly distributed across our network or even within individual markets. Thus, spectrum capacity must be assessed market by market and often cell site by cell site, based on our mix of spectrum capacity and varying demands both

across and within individual markets, in the latter case to accommodate highly concentrated usage demands from, as examples, a university, a stadium, or a highway. Those usage trends also can vary tremendously throughout the year, as in the case of communities that have high tourist or vacation traffic. Spectrum is not acquired at the cell site level, so we must secure spectrum in a market to guard against constraints occurring anywhere in that market. Moreover, as I noted above, planning is a multi-year process; we need to identify and acquire spectrum today to be prepared for network demands years into the future. SpectrumCo's AWS spectrum will help us anticipate and meet part of the expected capacity demands of our customers for continued high-quality services.

19. In determining projected spectrum needs we take into account the general trends and factors outlined above and compare it to our network capacity. Our spectrum evaluations must also assess current and projected capacity demands in each of our markets over a multi-year time frame, looking at the cell sites in those markets. In order to ensure a satisfactory customer experience, sound engineering practice is used to set appropriate limits on the amount of data traffic that can be handled by each of the sectors at a cell site – that is, the capacity of the cell sector. (Typically a cell site will have three sectors covering distinct portions of the area covered by the site.) Capacity is not merely determined by the amount of bandwidth being used but also by desired speeds. It also is affected by the speed at which customers can send and receive data. With data, we strive to deliver customers the speeds within the ranges that we describe. As discussed above, this puts a physical limit on the amount of capacity any one cell sector can handle simultaneously while maintaining desired speeds.

20. The process by which Verizon Wireless evaluates LTE capacity and spectrum needs is a multi-step process that occurs on an ongoing basis. Verizon Wireless collects mobile data

usage statistics. Data traffic and performance metrics such as data volumes and average user throughput are maintained in a database. We also consider other factors such as historical handset sales data as well as projections on future handset sales, customer data usage trends, and usage of and trends relating to new mobile applications. In addition, growth into markets that were previously not served is factored into the process.

21. This process provides an estimate of the future capacity at particular cell and sector locations. The capacity exhaust data is then used to forecast future spectrum needs. As individual cells become constrained due to increasing traffic levels, spot solutions can be applied to control the impact. As many cells within a market become constrained, it is much more effective to add additional spectrum to serve customer demand. Our current analysis indicates that many cell sites will be at high traffic levels and impacting service levels within three years, necessitating the need for additional spectrum to meet customer demand.

22. Moreover, in assessing and projecting demand we must also look at peak loads. This requires us to evaluate demand at all hours, because peak loads vary over time and across different markets. Our objective is to ensure we supply each site with sufficient spectrum capacity to handle peak loads, recognizing that those demands inherently change.

23. We continuously assess spectrum needs in markets across the nation. We have performed these assessments, for example, in many of the markets where we are acquiring spectrum in the secondary market.

24. Generally speaking, our earlier projections indicated that we would have sufficient spectrum in most areas served by our network until 2015, but that we would need additional capacity in some cell sites in various markets before that year. In some markets, for example, cell sites in urban areas or along heavily traveled traffic corridors show predicted constraints

earlier than cell sites in less populated or traveled areas of the same market. Of course, we cannot acquire additional spectrum on a site-by-site basis; instead we must acquire spectrum as it is available, and usually in much larger geographic areas, on the secondary market.

25. However, customer demands continue to outrun our estimates and the ability of successive, more spectrally efficient air interface technologies to keep pace. For example, as I noted earlier, we expect our 4Q11 network data traffic volume will be approximately double what our 2009 projection was. Also our most recent projections for data traffic in 4Q15 are now approximately seven times higher than what we projected in 2009. Given all of these factors, we could need additional spectrum in some markets as early as 2013.

26. Verizon Wireless' spectrum planning also encompasses identifying the most suitable spectrum bands for meeting network capacity demand, because each band has different technical characteristics and commercial availability in base stations as well as mobile devices. Our current LTE service, which is being deployed across most of the country, uses our nationwide 700 MHz C Block spectrum. Despite the spectral efficiencies and enhanced throughput provided by LTE technology, our projections show that this spectrum will not suffice to meet growing needs given the accelerating demand for data services. Our spectrum planning indicates we need to acquire and use spectrum to supplement the 700 MHz C Block for LTE.

27. AWS is the most cost-effective and spectrally efficient way for us to supplement our 700 MHz C Block spectrum. Our other spectrum holdings are either not available or not as suitable for this purpose as is AWS. Our cellular (850 MHz) and PCS (1.9 GHz) licenses are fully deployed to provide our nationwide CDMA Ev-DO Rev A and 1X services, which currently carry the lion's share of our data and SMS traffic and all of our voice traffic. While we hold various Lower Band 700 MHz licenses, this spectrum is not as suitable for our LTE

capacity requirements, because among other factors, the spectrum cannot be deployed as efficiently (or at all) in many markets because of the presence of existing Channel 51 television broadcast operations. The AWS spectrum is easier to integrate into a device, occupying a smaller footprint in a crowded unit and can be supported with a single RF electronics chain.

28. However, in many areas in the western half of the United States, we hold no AWS spectrum. The SpectrumCo transaction will supply our first AWS spectrum in those areas. In the eastern half of the country, we currently hold AWS spectrum, but this area includes some of the country's largest cities and metropolitan areas with highly concentrated populations, where we expect additional AWS spectrum will be especially needed. Even in smaller eastern U.S. markets where we hold AWS spectrum today, we project SpectrumCo's spectrum will also be needed to meet burgeoning customer demand. Given that 2013-2015 is not far away in terms of the need to plan for and obtain additional capacity, SpectrumCo's AWS spectrum will help us plan for and meet part of the expected demands of our customers for continued high-quality services.

I hereby declare under penalty of perjury that the foregoing declaration is true and correct to the best of my knowledge and belief. Dated this 16 day of December, 2011.

William H. Stone

WILLIAM H. STONE