Northeast Missouri Rural Telephone Company/ NEMR Telecom – Internet Service Disclosure

NETWORK MANAGEMENT PRACTICES

General description. NEMR Telecom provides a variety of Internet offerings to our residential and business customers over our broadband network and through other communication facilities connecting to the Internet. We monitor our network and traffic patterns and make changes we deem necessary to manage and improve overall network performance. We use reasonable, nondiscriminatory, network management practices to improve overall network performance to ensure a high-quality online experience for every user. We utilize a variety of tools and techniques to manage our network and deliver our service. We focus on staying compliant with our Acceptable Use Policy as well as our Terms and Conditions of Service. We may contract with one or more third-party companies for network monitoring and management services. Examples of our network management processes may include identifying and preventing the delivery of spam to our email customers accounts, detecting malicious traffic and preventing the distribution of viruses or other harmful conduct or content and using other tools or techniques to meet our goal of delivering the best possible Internet experience to our customers. Our network management practices do not target any specific content, application, service or device. In the process of any network management issues that may come about and/or as technology continues to develop, we may deploy additional or new network management practices.

Application-Specific Practices. This section discloses any application-specific practices we use, if any.

- **Management of specific protocols or protocol ports.** To protect the security of our network and our customers, we reserve the right to block down hostile ports. In such cases, we may block that specific port until the attack ceases, at which time we remove the block.
- **Modification of protocol fields.** Not applicable
- **Applications or classes of applications inhibited or favored.** Not applicable.

Congestion Management. The section below describes NEMR Telcom's Network Management practices used to address congestion on our network.

Congestion Management practices used.

- **Purpose of Congestion Management Practices.** NEMR Telecom's broadband network is a shared network. A shared network means that our customers share upstream and downstream bandwidth. NEMR Telecom's purpose for these management practices ensure better network availability and consistent speeds for all users. Our Congestion Management Practices serve to provide the following:
    - As our customer's demand for more and better broadband internet increases, it helps us adapt and upgrade our network to maintain or improve overall network performance.
    - Help us adapt and upgrade our network to improve network performance as demand for higher bandwidth applications increases. Examples of higher bandwidth applications are gaming, streaming movies in SD, HD, UHD, or higher, and any other needs requiring usage of broadband internet.

    - This practice also allows us to identify potential heavy bandwidth users.
- **Types of traffic affected.** Our congestion management practices do not target any specific content, applications, services, or devices, or otherwise inhibit or favor certain applications or classes of applications.
- **Network Monitoring.** We monitor our network usage for utilization trends. We monitor reports showing changes in our current and historical network traffic and congestion. We utilize this information to plan for increase in available bandwidth, upgrades of our network or additional connectivity to the Internet. If for some reason new technologies or unforeseen changes in the future make it necessary to implement an active congestion management program, we will update our disclosures and otherwise notify our customers of the scope and specifics of this program.
- **Potential heavy bandwidth users.** We utilize third-party software and reports showing end user usage for identification and management of potential heavy bandwidth users. NEMR Telecom may contact these customers whose bandwidth usage is not typical to a common NEMR Telecom residential customer. If solutions are not found and a customer continues to become excessive, NEMR Telecom reserves the right to limit, suspend, or terminate the high-volume user's Internet service.

Congestion Management Criteria.

- **Network Monitoring.** Our network monitoring procedures provides data so we are able to plan upgrades to our network, equipment, technology, and connectivity to the Internet. As demand for high bandwidth applications and demand for Internet services increase, we monitor effects on our network performance and plan upgrades as we deem necessary.
- **Effect on end user experience.** There are times our shared network will have periods of high network demand which may result in Internet traffic congestion. It is possible for end users to experience reduced bandwidth or speed during these times. Although we work to implement solutions to eliminate congestion, new technologies or unforeseen developments may require implementation of an active congestion management program. If this becomes necessary in the future to implement such programs, NEMR Telecom will notify its customers of the program and the criteria under which the congestion management will be implemented.
- **Potential heavy bandwidth users.** We will, in our sole reasonable discretion, determine the criteria for data consumption that is not characteristic of a typical residential user of NEMR Telcom's Broadband Service.

Blocking. NEMR Telecom does not engage in any practice, other than reasonable network management disclosed herein, that blocks or otherwise prevents end user access to lawful content, applications, service, or non-harmful devices.

Throttling. NEMR Telecom does not engage in any practice, other than reasonable network management disclosed herein, that degrades or impairs access to lawful Internet traffic on the basis of content, application, service, user, or use of a non-harmful device.

Affiliated or Paid Prioritization. NEMR Telecom does not engage in any practice that directly or indirectly favors some Internet traffic over other traffic to benefit an affiliate or in exchange for consideration, monetary or otherwise.

Device Attachment Rules. This section addresses any limitations on attaching lawful devices on our network.

General restrictions on types of devices to connect to network. We do not place general restrictions on lawful devices a customer may connect to our network, so long as the device follows these guidelines:

1. It is compatible with our network.
2. Does not harm our network or other end users.

Our broadband Internet service will work with most if not all electronic devices including PC's, laptops including Mac's, and any other Internet capable devices like game systems, and Smart TV's. If a password-protected wireless router is connected to our Internet service, wireless Internet compatible devices properly connected to the router including computers, tablets, smartphones, and other devices can connect to our network. If a customer believes they have a device or configuration that is out of the norm, our customer service department will help determine if there is a compatibility issue.

- **Router lease or purchase.** NEMR Telecom offers routers to customers on a monthly lease basis or a one-time purchase option for optional routers.
- **Wireless Internet Customer Premise Equipment.** NEMR Telecom's wireless internet service requires connection from specific wireless customer premise receivers to our network.

Network/End User Security. This section provides a general description of the practices NEMR Telecom uses to maintain security of our network. NEMR Telecom uses a variety of tools and techniques to protect our network and end users from malicious and unwanted Internet traffic such as preventing the distribution of viruses or other harmful code and preventing the delivery of spam to customer email accounts. When malicious behavior is identified NEMR Telecom employs various techniques to help provide a positive customer experience. Our security management system include that our hosted email is not propagating viruses, distributing spam email, or engaging in other malicious behavior. We provide antivirus and antimalware applications that customers are able to subscribe to these tools and practices may change from time to time to keep up with the new and innovative ways that customers use the network and to keep up with changing networks technologies. We also detect and mitigate DoS (Denial of Service) attacks for our High-Speed Internet customers.

Practices used to ensure end user security, including triggering conditions.

- **Virus and Spam Filtering:** Our third-party email (hosted) is filtered for virus activity and spam using industry standard virus scanning and prevention techniques. Should an email be found to contain a virus, the message will be deleted without notification given to either the sender or the intended recipients. All spam is quarantined; however, the email customer has the option to view or delete it.
- **DoS/Distributed DoS Monitoring and Mitigation:** A denial-of-service (DoS attack) or distributed denial-of-service attack (DDoS attack) is an attempt to make a computer unavailable to its intended users. Although the means to carry out, motives for, and targets of DoS attack may vary, it generally consists of the concerted efforts of a person, or multiple people, to prevent an Internet site or service from functioning efficiently or at all, temporarily or indefinitely. NEMR Telecom's upstream provider applies various security measures to prevent someone within the network from launching Dos or DDoS attacks to ensure that customers can access the Internet when needed.

PERFORMANCE CHARACTERISTICS

General Service Description. NEMR Telecom's broadband Internet service enables a customer to connect an Internet enabled device through either a wired or wireless connection. As of 2018, NEMR Telecom is in the process of upgrading its network from a copper connection to a complete Fiber-To-The-Home (FTTH) network. We use a variety of equipment to provide high-speed Internet to customers within our exchanges. FTTH customers have the ability to receive faster, and more consistent speeds whereas copper/DSL customers will be limited to the speeds they are able to reach pending length of the copper cable between their location and company equipment. Some of our exchanges are currently only on copper/DSL and have not been upgraded yet. Our NEMR Telecom broadband Internet access service includes wiring and an optical network terminal. Our broadband Internet access service enables residential and commercial subscribers to access all lawful content, applications, and services of their choice available on the internet.

We deliver our NEMR Telcom FTTH broadband Internet service using Active Ethernet or Passive Optical. Customers subscribing to our Fiber service will access our network using optical network terminals. To connect from our network to the Internet, we use fiber access equipment that acts as a gateway to the Internet for our customers.

Internet service providers cannot always guarantee a specific speed. However, NEMR Telecom's network provisioning and engineering practices are focused on enabling customers to receive the optimal speeds for the packages to which they subscribe. The actual speed a customer will experience while using the Internet depends on a variety of conditions. There are some factors that is beyond NEMR Telecom's control and can affect actual speeds for customer. Examples of these factors include:

- Website congestion – Examples would be Walmart.com, Amazon.com where there is high demand by multiple, simultaneous users.
- Wireless connections more than likely will be slower than wired connections in the home.
- Out-of-date technology such as older computers which can impact performance, software and operating builds, virus and malware issues.
- Latency issues with connecting to outside networks or servers.

Expected vs actual speeds and latency.

Expected performance. We offer our customers the ability to choose from a variety of broadband Internet service levels. You can visit www.nemr.net for a description of our service levels for both residential and business services.

Speeds. When you order NEMR Telecom High-Speed Internet service, the service and speeds that we advertise is advertised as an "up to" connection speed. We continually monitor and work to upgrade our network as needed, but our advertised speed is based on characteristics of relevant network facilities at the time you order. The actual throughput you experience may vary but should receive at least 90% or higher of the advertised speed you subscribe to. Wireless networks may vary internally based upon several factors that can affect performance in the home. These wireless factors vary pending on what frequency or band you are running in your home.

Latency. Latency is the time it takes for a data packet to travel from one point to another in a network. This can be highly variable based up several factors; network path, actual distance and performance of end destination of servers. It can increase with distance of the route between the source and

destination and with any congestion on the route, and decrease as actual speed increases. Latency in NEMR Telecom's network is measured by the round-trip time from the consumers home to the closest measurement server and back. Typical internet customers should expect roundtrip latency to most general Internet sites in the range of 25-150 milliseconds.

Customer Speed Test. Customers can go to www.speedtest.net and select Northeast Missouri Rural Telephone as the optimal server if they would like to check a theoretical speed.

Non-Broadband Internet Access (BIAS) Data Services.

Non-BIAS Data services offered to end users. NEMR Telecom offers Non-BIAS services to its customers. This service includes Internet Protocol video (IPTV).

Effects of Non-Bias data services on performance of BIAS. The provisioning of our Non-Bias data services has no effect on the capability and performance of our BIAS.

Fixed BIAS. NEMR Telecom provides Fixed BIAS services to its customers via DSL and Fiber. Customers should reasonably expect their fixed BIAS to deliver 90% and higher of the advertised speeds with a latency between 25-150 milliseconds.

Suitability of the Service for Real-time Applications. NEMR Telecom's broadband Internet access service is suitable for typical real-time applications. Examples of these applications are messaging, voice applications, video chat, gaming, online streaming. If customers have questions about real-time applications, they can contact the Network Manager at 1-660-874-4111.

Related documents and disclosures. Use of our broadband Internet access service is also governed by:

- NEMR Telecom's Acceptable Use Policy, available at www.
- NEMR Telecom's Terms and Conditions of Service, available at www.
- NEMR Telecom's Privacy Notice, available at www.

The following documents contain important information regarding NEMR Telecom's Broadband Service and its use and may be subject to updates and revisions. Customers are encouraged to review them on a regular basis.

Commercial Terms.

NEMR Telecom offers multiple residential and business Internet packages that provide different maximum downstream and upstream speeds. For more information regarding availability, prices, and fees, visit www. Prices and speeds are subject to change at any time.

NEMR Telecom does not store Internet traffic, provide it to third parties, or use it for non-network management purposes. NEMR Telcom's Privacy Policy can be found at www.

Consumers with questions or complains about our policies may contact NEMR Telecom at 1-660-874.4111 or email helpmail@nemr.net.