

MANAGEMENT'S DISCUSSION AND ANALYSIS

For the two-month period and the fourteen-month period then ended

December 31, 2021 and the year ended October 31, 2020



GENERAL

The following Management Discussion and Analysis of financial condition and results of operations ("MD&A") of NuRAN Wireless Inc. ("we", "us", "our", the "Company" or "NuRAN") for the fourteen-month period then ended December 31, 2021 has been prepared by management and should be read in conjunction with the audited consolidated financial statements for the fourteen-month period then ended December 31, 2021 and October 31, 2020 and the related notes thereto. The Company's consolidated financial statements are prepared in accordance with International Financial Reporting Standards ("IFRS"). References to notes are with reference to the consolidated financial statements. Unless otherwise noted, all currency amounts are in Canadian dollars. These documents, as well as additional information on the Company, are filed electronically through the System for Electronic Document Analysis and Retrieval (SEDAR) and are available online at www.sedar.com.

Unless otherwise stated, this MD&A is prepared as of April 30, 2022

DISCLAIMER FOR FOWARD LOOKING STATEMENTS

This MD&A contains forward-looking statements. Often, but not always, forward-looking statements can be identified by the use of words such as "plans", "expects" or "does not expect", "is expected", "estimates", "intends", "anticipates" or "does not anticipate", or "believes", or variations of such words and phrases or state that certain actions, events or results "may", "could", "would", "might" or "will" be taken, occur or be achieved. Forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of the Issuer (as defined herein) or NuRAN (as defined herein) to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Examples of such statements include: expectations regarding NuRAN's ability to raise capital, the intention to expand the business and operations of NuRAN and use of working capital and proceeds of capital raises. Actual results and developments are likely to differ, and may differ materially, from those expressed or implied by the forward-looking statements contained in this MD&A. Such forward-looking statements are subject to a number of risks as outlined below under "Risks and Uncertainties" and include risks such as the uncertainties regarding the impact of the COVID-19 outbreak, and measures to prevent its spread, risks relating to NuRAN's business and the economy generally;; NuRAN's ability to adequately restructure its operations with respect to its new model of NaaS service contracts; the capacity of the Company to deliver in a technical capacity and to import inventory to Africa at a reasonable cost; NuRAN's ability to obtain project financing for the proposed site build out under its NaaS agreements with Orange and other telecommunication providers, the loss of one or more significant suppliers or a reduction in significant volume from such suppliers; NuRAN's ability to meet or exceed customers' demand and expectations; significant current competition and the introduction of new competitors or other disruptive entrants in the Company's industry; NuRAN's ability to retain key employees and protect its intellectual property; compliance with local laws and regulations and ability to obtain all required permits for our operations, access to the credit and capital markets, changes in applicable telecommunications laws or regulations or changes in license and regulatory fees, downturns in customers' business cycles; and insurance prices and insurance coverage availability, the Company's ability to effectively maintain or update information and technology systems; our ability to implement and maintain measures to protect against cyberattacks and comply with applicable privacy and data security requirements; the Company's ability to successfully implement its business strategies or realize expected cost savings and revenue enhancements; business development activities, including acquisitions and integration of acquired businesses; the Company's expansion into markets outside of Canada and the operational, competitive and regulatory risks facing the Company's non-Canadian based operations. These forward-looking statements should not be relied upon as representing NuRAN's views as of any date subsequent to the date of this MD&A.

Although NuRAN has attempted to identify important factors that could cause actual actions, events or results to differ materially from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended. There can be no assurance that forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward looking statements. The factors identified above are not intended to represent a complete list of the factors that could affect NuRAN. Such statements made by the Company are based on current expectations, factors and assumptions and reflect our expectations as at December 31st, 2021. Except as required by applicable law, we undertake no obligation to publicly update or revise any forward-looking statement, whether as a result of new information, future events or otherwise.

For a description of material factors that could cause the Company's actual results to differ materially from the forward-looking statements in this MD&A, please see "Risks and Uncertainties" below.

CORPORATE STRUCTURE

NuRAN was incorporated under the *Business Corporations Act* (British Columbia) on September 23rd, 2014. The Company was initially a wholly-owned subsidiary of Bravura Ventures Corp. ("Bravura"). On October 14th, 2014, the Company entered into an arrangement agreement with Bravura and 1014379 B.C. Ltd., pursuant to which the shareholders of Bravura exchanged certain common shares of Bravura for common shares of NuRAN by way of a plan of arrangement (the "Arrangement") and NuRAN became a reporting issuer in the provinces of British Columbia and Alberta.

Following completion of the Arrangement, NuRAN entered into an amalgamation agreement dated March 11, 2015 with Nutaq Innovation Inc. ("Nutaq") and 9215174 Canada Inc. ("Newco"), a wholly owned subsidiary of NuRAN formed for the purpose of the amalgamation, pursuant to which Nutaq amalgamated with Newco and NuRAN acquired all of the issued and outstanding shares of the amalgamated company in consideration of 32,999,994 common shares of NuRAN based on a ratio of 2.749 NuRAN common shares for each share of Nutaq issued and outstanding on the closing date. Nutaq and Newco completed the amalgamation on June 2nd, 2015 and the amalgamated company was named "Nutaq Innovation Inc.". Following the closing of the transaction, NuRAN had 40,471,869 common shares issued and outstanding and former shareholders of Nutaq acquired 81.5% of the issued and outstanding common shares of NuRAN. Following closing of the Amalgamation, Nutaq Innovation Inc. is a wholly owned subsidiary of NuRAN and NuRAN operated the business of Nutaq.

Nutaq was incorporated under the laws of Canada on May 30, 2005 under the name "Lyrtech RD Inc.". Nutaq changed its name to "Nutaq Innovation Inc." on August 31, 2012; its registered and head office is located at 2150 Cyrille-Duquet Street, Suite 100, Quebec, Quebec G1N 2G3. On August 28, 2020 the Board of Directors of Nutaq voted to cease operations and on that date all of its board members, except Mr. Francis Letourneau, resigned their respective positions. On August 31, 2020 Nutaq announced the decision and filed an insolvency proceeding and on September 1, 2020 the Company approved the appointment of Lemieux Nolet as trustee for Nutaq's bankruptcy proceedings. At the same time trading of the Company's stock was halted.

On September 22, 2020, the trustee and Nutaq's first ranking secured creditors reached an agreement pursuant to which all of the assets of Nutaq, including all inventory, equipment and R&D equipment, trademarks, patents, accounts receivables, bank account and SR&ED credits would be sold. On October 27, 2020, the parent company re-acquired these Nutaq Assets for \$100,000.

As a result of the insolvency proceedings, the Company eliminated/extinguished the obligation to repay certain creditors and recorded a \$1.5 million gain on the extinguishment of liabilities. As well, the Company assumed obligations of Nutaq. Some of these transactions and the events that have taken place subsequently are explained more fully in the notes to financial statements.

In 2021, NuRAN incorporated two wholly owned subsidiaries, NuRAN Wireless Cameroon LTD. and NuRAN Wireless DRC S.A.R.L.U., to own and manage the networks that the Company is developing in those countries.

NuRAN also incorporated on April 28, 2022 a subsidiary that will hold all of its African investments. This subsidiary will raise debt and equity to fund the Africa development of the African networks.

NuRAN modified its bylaws to change its financial year-end from October 31 to December 31. The current year is a transition year for the Company covering the 14 months ended December 31, 2021.

The Company has completed the final step in unwinding the bankruptcy of its wholly owned subsidiary, Nutaq Innovation Inc. ("Nutaq"). NuRAN's proposal to creditors was accepted by the bankruptcy court on March 17, 2022 and a final payment of settlement made. On March 25, 2022, Nutaq received a Certificate of Full Performance of Proposal issued by the Licensed Insolvency Trustee and signifying that Nutaq is released from the debt included in the proposal. The Company is planning to merge Nutaq with NuRAN to enable the Company to utilize tax losses.

DESCRIPTION OF BUSINESS

NuRAN is a leading supplier of mobile and broadband wireless infrastructure solutions. Its innovative radio access network (RAN), core network, and backhaul products dramatically reduce the total cost of ownership, giving mobile network operators (MNOs) the ability to profitably serve remote, low income and low population density locations, an unfeasible proposition with existing systems.

NuRAN's current business focus is to grow the market penetration of its Network as a Service (NaaS) offering, a communications solution whose backbone is its Wireless Infrastructure Systems (WIS).

NuRAN's WIS are mobile wireless infrastructure equipment (e. g. base station radios) that use proprietary breakthrough small cell solutions to offer better coverage, the lowest installed cost, the most efficient power consumption combined with leading technology for satellite bandwidth reduction usage currently available in the global marketplace.

Our design provides two key competitive advantages:

- Low total cost of ownership, a key feature for developing countries and rural/low population density areas, and
- Small footprint, easy to deploy private networks, customizable for large scale deployments such as rural mobile networks and specific markets such as defense, utilities, industrial and machine-to-machine ("M2M").

NuRAN's NaaS model leverages the capabilities of its WIS as well as its extensive expertise in building cost-effective cellular infrastructure. The model provides not only the network equipment, but NuRAN also builds, operates and maintains the cellular sites in a very effective manner. The NaaS model is receiving significant interest from MNO's as a carrier-grade mobile network infrastructure solution that allows them to continue focusing their capital expenditures into developing new technologies, while being able to reach previously uneconomic markets. Another reason for this growing interest in the NaaS is that it allows MNO's to meet the obligations to serve



remote communities that are a requirement of their government licenses. The investment in the NaaS model is customer friendly but it also provides NuRAN with long-term recurring revenues resulting in a compelling return over 10 year contract periods or in the future, indefinite contract lengths featuring continued asset ownership by NuRAN.

NuRAN's wireless infrastructure solutions are also capable of supporting mobile payment transactions, a tremendous social and economic benefit for those in the developing world where 95% of all transactions are cash and 60% of adults don't currently have a bank account, as well a significant potential market for MNO's.

By deploying communication infrastructure in uncovered areas, NuRAN also makes a very significant contribution to the socio-economic conditions of the areas it serves and meets a significant number of the seventeen sustainable development goals set by the United Nations. This includes improving the local economies and enabling access to e-learning, e-health and other social services not currently available to the local population.

GENERAL OBJECTIVES

The Company's mission is to enable its clients to profitably connect the 4 billion people without broadband connectivity, including 1 billion people that do not have the benefit of accessing reliable telecommunications and power infrastructure.

The company delivers the world's most affordable, lowest power consumption and easiest to deploy wireless solutions. NuRAN deploys its own breakthrough small cell solution in traditionally underserved and emerging markets, addressing the CapEx and OpEx challenges of operators, allowing Telcos to deploy profitably in the least population dense and most remote areas.

OVERALL PERFORMANCE AND OUTLOOK

Performance

During the fourteen-month period then ended December 31, 2021, the Company continued the implementation of its strategy to become the supplier of choice to Mobile Network Operators (MNOs) across the world to connect remote and rural areas that until now could not take advantage of the economic and social benefits of connectivity.

Management's decision to redirect NuRAN's efforts to the NaaS market was made with the awareness that this would require considerable initial investments in marketing, branding, sales, field tests and to prepare for increased production as well as working capital to fund rollout and installation of networks. The recovery of this investment that was planned in future years through recurring sustainable and more predictable revenues, increased market visibility, higher sales and better gross margins is starting to show.

In spite of the longer than expected timeframe in the rigorous qualification processes that MNO's required to obtain approval of NuRAN's equipment and operating procedures prior to endorsing the use of our systems, the contracts executed to date, those currently being negotiated, and the growing sales pipeline confirms management's vision.

The Company's ongoing investments in research and development, engineering and manufacturing have been rewarded with the acknowledgment by leading industry organizations and participants that NuRAN's Wireless Infrastructure Solutions are "at the top of its class".



In addition, NuRAN's marketing and branding efforts as well as the performance of the sites installed to date have significantly increased the market's awareness of its wireless solutions.

The economic disruption caused by the pandemic created additional challenges for NuRAN: obtaining supplies in a timely basis, revamping operational procedures to ensure the safety of our staff and a slower decision making by some of our financing partners and customers to name a few. The Company addressed these challenges: our people have worked relentlessly to methodically recover the site development delays and we also strengthened our supply chain adding as many African suppliers as possible. The pandemic has also positively impacted the growing demand of connecting the unconnected.

It being the first year of deploying NaaS combined with small but growing local teams, we faced challenges in achieving the necessary level of accuracy and cutoffs in our inventories of network infrastructure held by our subsidiaries. With equipment sourced from various suppliers, in various locations including port holding facilities, warehouses maintained by our suppliers, goods in transit to sites and our own stocks, the classification of assets was more complex than anticipated. This logistical situation as well as the still ongoing travel complexities restricted the Company and our auditors from performing the necessary checks that they required. We therefore had to conduct a remediation plan concerning the inventory values post year-end which we can report resulted in finalising all audit values. Management's plan to resolve the situation going forward includes the implementation of a companywide, global Enterprise Resource Planning (ERP) system which is already underway, the implementation of stringent policies and procedures and the training of all staff to maintain the integrity of all financial information and systems.

As of April 30, 2022 the Company has 51 sites in Cameroon, 29 in the DRC and 7 in Ghana now connecting over 480,000 inhabitants. As at December 31, 2021, \$817,000 of equipment was activated and \$4.3 million of equipment ready for deployment in those countries (as of December 31st).

Management has in place the financing for Phase 1 of 122 sites of the Cameroon project and raised \$4 million used for the deployment of sites in DRC. The Company also announced 2 mandate letters from European development finance institutions (DFIs) with a total value of US\$ 24 million, subject to US\$ 6 million of additional equity or debt financing, for the rollout of 852 additional sites.

Some of the operational achievements that support management's belief in the growing adoption by MNO's of the NaaS model include:

CAMEROON:

The following information is as of April 30, 2022

- Total sites deployed to date: 51.
- Total population covered: approximately 254,000 inhabitants.
- Average penetration rate of 47%; our projections were based on a 24% penetration rate. Approximately 119,000 users have connected to the NuRAN network.
- Average revenues currently being generated from these sites are approximately \$2,081 and over 60% of the sites are already generating more than the average \$1,225 minimum guaranteed monthly fee.
- Commercial promotion activities have yet to commence on the sites and therefore NuRAN anticipates higher usage in the future.

- Quality of Service (QoS) is averaging a rating of approximately 96.77% far exceeding the minimum requirement of 90%.
- NuRAN is now generating regular invoices to Orange Cameroon for sites deployed.
- Due to the unexpectedly high performance of the sites, and at the request of Orange, NuRAN has temporarily paused further deployment of sites in order to focus on upgrading existing sites. Rollout of new sites will resume in parallel.
- NuRAN and Orange have planned to complete the rollout of the first 122 sites by end of fiscal Q2 2022.
- The second wave of deployments or the additional 120 sites will begin in fiscal Q3 2022.
- The two organizations are working on a 3G/4G pilot rollout for Q3 2022.
- Orange declared that they expect to expand the scope beyond the 242 sites.

DEMOCRATIC REPUBLIC OF THE CONGO:

The following information is as of April 30, 2022

- Total sites deployed to date: 29.
- Total population covered: approximately 217,964 inhabitants.
- The average revenue per site is surpassing the average minimum guaranteed monthly fee of \$1,040 by 22%.
- The initial 12 of 29 sites have been stabilized. Corrective measures are currently being implemented to improve power and satellite efficiency on the other 17 sites to increase the performance of the sites.
- No commercial promotion activity has yet been launched.
- The site selection process has been reviewed in order to further increase performance.
- NuRAN will resume deployment in May 2022 and expects to complete 118 sites by the end of Q2, 2022.

SOUTH SUDAN:

The following information is as of April 30, 2022

- Site Surveys and Site Acquisition have commenced with the assistance of the local partner, Tandem (in 2022).
- Network Element Integration performed in May 2022.
- 20 sites are planned to be delivered by mid July 2022.
- Following this, due to the rain and flood season, there will be a pause in roll out until December when an additional 30 sites will be deployed.

As at December 31st \$1.4 and \$2.31 million of inventory is held in Cameroon and the Democratic Republic of the Congo respectively, representing tower parts available for deployment as soon as the full bill of material is received or custom cleared.

Once the 242 sites of both phases of the Cameroon network are fully operational, expected in Q1 2023, the contract with Orange Cameroon is expected to generate annual revenue of over \$7 million assuming a conservative 24% penetration rate and average revenue per site of \$2,000.00/month.

The Company's implementation of the NaaS contract with Orange DRC SA to build 2,000 sites throughout the Democratic Republic of the Congo that will generate annual gross revenues expected to exceed \$48 million assuming a conservative 22% penetration rate once all sites are fully operational.

Including recently announced contracts (in 2022) with MTN in South Sudan and Namibia, the Company expects to generate approximately \$70 million yearly over the 10 years of these agreements. Each contract includes an option to extend the term and increase the quantity of sites. Each site's term is for 10 years from the date the site becomes operational.

Managements' belief in the increasing adoption of the NaaS model by MNOs is supported by a number of achievements:

- On December 16, 2021 the Company announced the signing of an agreement for a minimum of 250 sites with MTN Group Limited (JSE:MTN) for the deployment of rural sites under the NaaS model in the Republic of South Sudan ("South Sudan"). The 10-year agreement is estimated to represent approximately \$5.4 million in revenue annually once all the sites are active based on estimates of \$1,800 of revenue per site per month. The contract includes the potential for more sites to be added and the ability to leverage terrestrial backhaul networks to deliver inexpensive data capacity that is intended to drive higher ARPU and revenues. The parties intend to install a minimum of 250 rural networking sites in South Sudan within the next 24 months. NuRAN will partner with Tandem Solutions Ltd ("Tandem"), a local partner and already familiar to MTN. Tandem is fully licensed for infrastructure work in the country.
- On April 14, 2022, the Company announced a contract with MTN in Namibia to deploy suburban and rural telecom sites for a minimum of 150 sites. All the sites delivered will be in 4G demonstrating the evolution and expandability of its NaaS model and once the project is completed annual revenue will be \$8 million.
- The Company continues the execution of a \$4.75 million contract with Intelsat for the delivery and installation of NuRAN's Wireless Infrastructure Solutions to expand and enhance mobile connectivity services to the Marshall Islands. The work started in 2020 and, despite delays caused by the pandemic, to date approximately 42% of the contracted services have been delivered with further site deployment underway as at today's date. The final phase of the program is expected to be delivered in 2022.
- NuRAN completed the site build of its project in Ghana for Vodafone financed through a GSMA Connected Society Innovation Grant for rural connectivity. The Company is now managing daily operations, monitoring and maintenance of 7 sites in Ghana with 3G capability added to 4 sites. Over the next 12 months, GSMA and NuRAN will report on the outcome of the performance on the project with initial indications that site penetration of almost 50% has been recorded. The project is also intended to expand the GSMA network and relationship with Vodafone.
- The signing of the above-mentioned contracts and proposed financing agreements confirms the quality of the Company's products and NuRAN continues to engage with African MNO's to identify future opportunities and grow its qualified pipeline.
- The Company has been short-listed for the final round of requests for proposal (RFPs) for Orange SA in four different countries in sub-Saharan Africa.
- On April 28, 2022, the Company was selected by a Tier-One Mobile Network Operator as part of its Rural RFP for thousands of network sites in over 15 countries in Middle East and Africa. This selection assures NuRAN the opportunity to bring its unique turnkey rural and remote mobile connectivity solutions to over 15 countries and therefore potentially connect up to 50 million additional people.
- The Company has now begun business development activities in Latin America and is evaluating several



opportunities in Peru, Brazil, Ecuador and Mexico.

- The United States Patent Office granted the Company with a patent related to 5G Massive MIMO.
- In June 2021, NuRAN announced the marketing launch of its new LiteRAN xG product. The product will provide 2G, 3G and 4G services fulfilling MNO requirements to have a flexible and scalable solution for rural generation expansion. The first products will be installed in the Marshall Islands in the second half of 2022.
- NuRAN intends to perform 3G and/or 4G pilots in Cameroon and DRC in 2022.

Some of the financial achievements that support management's belief in its ability to complete the building of the networks currently under development and those being negotiated include:

- On July 12, 2021 the Company completed a non-brokered private placement of common shares and warrants for gross proceeds of \$11,096,045. In connection with the Offering the Company issued 4,636,930 units (each comprised of one Common Share and one Warrant) for gross proceeds of \$7,096,045 and received a lead order to subscribe for 2,614,379 Common Shares and 182,000 Warrants for gross proceeds of approximately \$4,000,000 from Space-Communication Ltd., an international satellite communication provider. Following closing of the Offering, Spacecom held a 9.3% equity stake in the Company on an undiluted basis. The investment includes an agreement for Spacecom to become the exclusive satellite capacity provider for existing and future NaaS projects in Africa. In addition, the Spacecom proceeds will be directed to the rollout in DRC, assuring a strong beginning to the rollout. Other important terms include the right for Spacecom to participate in investment in other African subsidiaries and to match any other financing offers. Spacecom's financial strength and commitment to the future business, as well as the proceeds of the placement, including warrants, gives the Company a much-needed financial injection and strength to accelerate its growth ambitions.
- As at December 31, 2021 all secured debt holders have converted their debt into equity.
- As at March 18, 2022, the Company signed the final agreement with Afriland First Bank in Cameroon for a \$2,875,000 loan facility with proceeds to be used for infrastructure investment in Cameroon. The loan is for a five-year term with an initial six-month capital grace period and an annual interest rate of 9%.
- As at January 6, 2022, the Company signed an agreement in principle with a development finance institution (DFI) for a senior secured credit facility of up to US\$15,000,000 ("Facility One") to finance a portion of NuRAN's network infrastructure installations being rolled-out in Cameroon and in the Democratic Republic of the Congo (the "Project"). Facility One is conditional on, amongst other customary conditions in a financing of this nature, NuRAN raising the remainder of the US\$15,000,000 in funding for the Project, the lender's due diligence and customary conditions, events of default and covenants. Facility One is for a term of seven years including two-year grace period on repayment of principal, and disbursements may be requested for up to 36 months from closing. Interest is to be paid at either a fixed or floating rate as specified by the Borrower for each tranche.
- As at January 14, 2022, the Company signed a second mandate letter for another senior secured credit facility ("Facility Two") with another DFI that provides up to EUR 8,000,000 in total funding to further finance the Project. Facility Two is conditional on, amongst other customary conditions in a financing of

this nature, NuRAN raising the remainder of the funds required for the Project, the lender's due diligence and customary conditions, events of default and covenants. Facility Two is for a term of seven years including a two-year grace period on repayment of principal, and disbursements may be requested up to 36 months from closing. Interest is to be paid at a rate that is calculated based on a margin over six months EURIBOR.

- As at April 28, 2022, the Company incorporated NuRAN Wireless (Africa) Holding based in Mauritius. This subsidiary will hold its African operations and it is expected that the balance of funding required for The Project will be raised at this level.
- As at March 17, 2022, the Company closed a secured convertible debenture in the principal amount of \$2,235,465. The Debenture had an original issuance discount of 10% and is convertible into common shares of the Company (each, a "Share") at a price of \$1.35 per Share. The Debentures will mature on March 17, 2023 and are secured by way of general security agreement. The Debentures may be prepaid by the Company at any time prior to the Expiry Date, upon ten business days' notice to the holder of the Debenture, subject to the Company paying a price equal to 103% of the principal amount of the Debentures then outstanding plus accrued and unpaid interest thereon.

The above progress and achievements reinforce management's belief in the success of the Company's strategic shift and its belief that NuRAN is positioned to become the market leader in this very important and growing space and deliver strong returns to its shareholders.

Outlook

NuRAN's wireless infrastructure solutions have long been deployed by MNOs as an integral part of their network operations and now under the NaaS model in extending rural coverage. NuRAN solutions are being either tested or operated by MNOs in more than 20 countries across Southeast Asia, Africa, South America and Latin America. NuRAN has also established alliances with other key industry participants such as tower and power companies to further increase its market reach. Management believes that the successful acceptance and adoption of NuRAN's system by MNOs and partnerships with key industry players place NuRAN in a position to generate significant sustainable business.

NuRAN previously announced that development is underway on LiteRAN xG, a mobile wireless infrastructure solution that will provide operators with 2G, 3G, & 4G capability from a single piece of equipment allowing them to run multiple technologies simultaneously and evolve their services over time. Deployment will proceed with Intelsat and the GSMA program in Ghana. The addition of LiteRAN xG to the Company's portfolio significantly widens the Company's addressable market.

The market adoption of NuRAN's NaaS offering is gaining traction, as demonstrated by the latest signing of a 250 site contract in 2021 with MTN South Sudan following two MNO contracts totaling 2,242 sites with Orange SA and interest expressed by other MNOs in informal discussions and signed MOUs. MNO's recognize the quality of NuRAN's carrier-grade mobile network infrastructure solutions, its extensive expertise in the installation and management of cost-effective cellular networks as well as the economic benefits of being able to reach a large base of customers not reachable to date that NuRAN's systems provide.

The following discussion of the Company's financial performance is based on the consolidated financial statements for the fourteen-month period then ended December 31, 2021 and fiscal year 2020.



Factors Concerning the Company's Financial Performance and Results of Operations

To evaluate the results of the strategic shift, management closely monitors four key measures of the Company's performance: Revenue, Gross Profit Margins (GPM), Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) and Net Income.

Revenue growth measures the success of the NaaS solution combined with our marketing and sales efforts. This is dependent on the Company's ability to enter into contracts, build NaaS infrastructure, penetrate new markets and gain new customers for existing and new products and services. The investments in marketing and sales and the new products launched since 2016 have increased our sales pipeline, started to generate sales with first sites live and should produce increasing revenues as rural subscribers in previously covered and uncovered areas take advantage of more choice, availability and variety of mobile services to improve their economic position. The takeup of NaaS solutions and the resultant recurring revenue stream brought on by each live site will generate transformative growth in revenue for the Company.

GPM measures how efficiently and effectively NuRAN delivers its systems and services to its clients, both in terms of production of its product line, and increasingly, delivery of the NaaS solution in rural areas.

Our NaaS agreements were designed to minimize our risk by ensuring a reasonable return on each site through the minimum guaranteed monthly fee which covers direct operating expenses, capital repayment and interest. The revenue share above this level and included in all contracts provides additional revenue-generating potential.

Due to the IFRS accounting rules interpretation of the terms of our NaaS agreements with Orange, we are required to record the sale of each site in Cameroon and DRC at the time the site becomes operational, rather than at the time the ownership of the site is transferred (5 or 6 years from the date a site becomes operational).

As a result, our monthly GPM is unduly reduced. Early stage rollout will severely impact GPM due to the recognition of the sale of equipment. To properly monitor the Company's operating performance, management will be monitoring two GPM indicators for NaaS: one on the sale of the site and another on the site's monthly operational fees.

As at December 31, 2021 results were further impacted by the fact that the operating sites only went live during the last 3 months of the year and for some sites, only a pro rata of recurring revenue has been accounted for depending on their activation date. Since some fixed costs start once the site is operational (site rent and VSAT minimum fees for example), profitability takes some time to build whilst revenue is increasing to the expected levels.

EBITDA measures the entire operations by including selling and administrative costs. It should increase as sales grow.

Management believes that net income is a measure of how efficiently and effectively the business is running, however recognises that, given the stage of NaaS rollout and implementation, it is likely to be loss-making for some time. To achieve an acceptable net income, the company needs to significantly increase its revenues, while maintaining or slightly increasing its selling and general administration costs and efficiently utilising the capital assets that it deploys, including the NaaS model.

In spite of incurring losses, management achieved a significant improvement in the balance sheet during the fourteen month period. This was a result of the forbearance agreement and settlement of convertible and long term debt in the first half of the year, followed by the private placement in July which allowed for significant

investments in the NaaS business and infrastructure. The Company also reversed the provision for deferred tax as a result of unwinding the bankruptcy of Nutaq. The company positioned itself very favourably to benefit from tax losses to be applied against future profits of the NaaS operations and a streamlined balance sheet allowing for future borrowings.

SELECTED ANNUAL FINANCIAL INFORMATION

The following is selected financial data derived from the consolidated financial statements of the Company as at December 31, 2021 and October 31, 2020 and for the periods then ended:

	Fourteen-month period then ended December 31 st , 2021	Year ended October 31 st , 2020	Year ended October 31 st , 2019
Total revenues	\$ 2,137,616	\$ 3,930,078	\$ 2,122,167
Total loss	\$ (12,718,098)	\$ (2,107,861)	\$ (3,548,993)
Net loss per share – basic and diluted	\$ (0.58)	\$ (0.3)	\$ (0.57)

	As at December 31 st , 2021	As at October 31 st , 2020	As at October 31 st , 2019
Total assets	\$ 15,035,632	\$ 7,645,052	\$ 8,828,268
Total non-current financial liabilities	\$ 559,112	\$ 2,233,722	\$ 632,911

RESULTS OF OPERATIONS

Revenue

The \$1,792,462 decrease in revenue for the fourteen-month period then ended December 31, 2021 compared to the year ended October 31, 2020 (\$1,807,911 increase for the year ended October 31, 2020 compared to the year ended October 31, 2019) results from the continuing shift in focus to the NaaS model which generates stable, predictable and recurring rather than the one time revenue from equipment sales. The \$2,137,616 in revenue includes \$788,390 for the sale of NaaS sites and \$20,380 of services revenue during the period while normalised revenue for these same sites is expected to be over \$68,000 per quarter. The recognition of the sale of sites is required by IFRS 15 as described above.

Gross Profit

Gross profit for the fourteen-month period then ended December 31, 2021 decreased by \$701,804 compared to year ended October 31, 2020 (increased by \$353,312 for the year ended October 31, 2020 compared to the year ended October 31, 2019).

Gross margin for the fourteen-month period then ended December 31, 2021, decreased to 18% from 28% for the year ended October 31, 2020 (decreased to 28% for the year ended October 31, 2020 from 34% for the year ended October 31, 2019).

The 2021 gross margins were impacted by the initial costs of the rollout of our NaaS operations (including site lease and VSAT minimum costs) as well as writing down of obsolete inventory, the elimination of Covid government subsidies and lower production volumes.

In addition we have \$807,433 of equipment costs attributed to the sales of the sites that became operational as required by IFRS 15.

Expenses

During the fourteen-month period then ended December 31, 2021 total expenses increased by \$10,473,000 from the year ended October 31 2020 (for the year ended October 31, 2020 total expenses decreased by \$739,164 from the year ended October 31, 2019). A significant portion of this expense was accounted for by a \$4,975,746 non-cash charge for share-based compensation for the Company's senior executives, 866,438 for the Company's Directors and staff and \$940,093 for consultants. Selling expenses increased marginally over the prior year as the Company focused its efforts on expanding the reach of its NaaS offering across Africa and other markets. R&D expenses net of tax credits fell during the year as a result of the reduced headcount and cost containment measures including more reliance on third party contractors. Administrative expenses excluding share-based compensation increased for the period mainly as a result of increased professional fees, additional expenses incurred in establishing African operations including procurement activities and costs to support the Company's on-going financing initiatives. Of these remaining costs, over \$550,000 are non-recurring.

Net Loss Before Other Elements and Income Taxes

As a result of all the factors mentioned above the Net Loss Before Other Elements and Income Taxes for the fourteen-month period then ended December 31, 2021 increased to \$13,633,966 from the year ended October 31, 2020 loss of \$2,459,152 (for the year ended October 31, 2020, total Net Loss Before Other Elements and Income Taxes decreased to \$2,429,152 from the year ended October 31, 2019 loss of \$3,551,628).

Other Elements

Other Elements for the fourteen-month period then ended December 31, 2021 generated a net loss of \$493,949 compared with a net gain of \$1,761,108 in the year ended October 31, 2020 (a net gain of \$1,761,108 for year ended October 31, 2020 compared to a net gain of \$2,635 for the year ended October 31, 2019). This loss related to charges for the debt settlement in shares as well as a loss on disposal of assets.

Net Loss and Total Comprehensive Income

As a result of all the factors mentioned above the Net Loss and Total Comprehensive Income for the fourteen-month period then ended December 31, 2021 increased to \$12,718,098 from the year ended October 31, 2020 loss of \$2,107,861 (for the year ended October 31, 2020 decreased to \$2,107,861 from the year ended October 31, 2019 loss of \$3,548,993).

Expenses

Below is a discussion of the expenses for the fourteen-month period then ended December 31, 2021

	Fourteen-month period then ended December 2021	2020	% change from 2020
Selling expenses	1,413,458	869,894	+62%
Administrative expenses	5,881,731	1,301,134	+353%
Employee share-based compensation	5,842,184	-	+100%
Financial expenses	498,629	458,545	+9%
Research and development costs	378,447	911,876	-58%
	14,014,449	3,541,449	296%

Selling expenses

Selling expenses consist of salaries to sales and marketing staff, commissions on sales, travel expenses, trade shows and presentations. The increase is a result of increased headcount including regional sales reps focused on MNO clients as well as increased advertising and promotions activity aimed at increasing the recognition of the company brand and positioning.

Administrative expenses

Administrative expenses consist of remuneration, legal fees, audit and accounting fees, insurance, rent, consulting fees and general office expenses. The increase in administrative expenses is due mainly to costs associated with the restructuring of the business, fund-raising including the private placements and borrowing facilities to fund the rollout of NaaS, and the launch of operations in 2 countries in Africa.

Financial expenses

Financial expenses consist of loan interest and gain/loss on the exchange rate. The decrease in financial expenses for the fourteen-month period then ended December 31, 2021 compared to the year ended October 31, 2020 is a result of exchange rate gains and the reduced debt load including the eventual conversion of all long term debt to equity.

Research and development

Research and development costs for the fourteen-month period then ended December 31, 2021 have decreased from the year ended October 31, 2020 as the Company focused its R&D efforts including the use of external contractors. The Company has \$274,110 of Scientific research and experimental development tax credits receivable as at December 31, 2021.

SUMMARY OF QUARTERLY RESULTS

Three Months Ended	Total revenues (\$)	Total profit (loss) (\$)	Basic and Diluted Loss Per Share (\$)
31-Dec-21 (Two months)	730,297	97,984	(0.00)
31-Oct-21	519,061	(5,018,582)	(0.24)
31-Jul-21	7,363	(5,316,766)	(0.23)
31-Apr-21	410,488	(1,116,545)	(0.06)
31-Jan-21	470,407	(1,364,190)	(0.09)
31-Oct-20	132,797	(753,800)	(0.08)
31-Jul-20	319,228	(71,545)	(0.00)
30-Apr-20	1,432,841	(1,089,155)	(0.01)
31-Jan-20	2,045,212	(193,361)	(0.00)

Two months ended December 31, 2021

During the two months ended December 31, 2021, the Company earned revenues of \$730,297 compared to \$132,797 during the three months ended October 31, 2020, an increase of \$597,500.

For the two months ended December 31, 2021, the Company incurred a gross profit of \$97,984 compared to gross loss of \$753,800 for the three months ended December 31, 2020.

LIQUIDITY AND CAPITAL RESOURCES

The Company's cash increased to \$731,191 as at December 31, 2021, from \$64,254 as at October 31, 2020. Current assets increased to \$8,228,510 as at December 31, 2021, from \$1,885,190 as at October 31, 2020.

The cash position has increased significantly as at December 31, 2021 compared to October 31, 2020 due to the proceeds of the private placement.

Future Financing

Management closely monitors the Company's current cash position and the short-term and long-term cash requirements and recognizes the need for improved cash flow and liquidity for future operations and growth. The Company will look for additional financing for costs related to operations and its growth strategy (including the purchase of new equipment, continuous development of next generation wireless solutions such as the multi-Standard 2G, 3G, 4G platform, as well as the deployment of mobile infrastructure under the NaaS model).

Although the Company's cash position at the end of December 31, 2021 was significantly positive, current inflows are not sufficient to cover its selling, administrative and R&D costs and finance the capital investment necessary to implement its NaaS contracts. The Company will continue to depend on its ability to convert its sales opportunities into purchase orders (for example the recently signed agreements with Orange SA for Cameroon and DRC and with MTN for South Sudan), raise debt to finance NaaS projects and future equity issuances or other means to finance its operations, including the completed private placement.

The ability of the Company to continue operating will therefore be dependent upon obtaining additional financing as required. The timing and ability to do so will depend on the liquidity of the financial markets as well as the

acceptance of investors, in addition to the results of the Company's operations. Although management believes that the company will be able to raise the necessary financing, and that its financial position has improved, there can be no guarantee that these efforts will be successful.

RISKS AND UNCERTAINTIES

Additional Financing Requirements and Access to Capital

NuRAN's ability to realize its assets and discharge its liabilities depends on the continued financial support of its shareholders, the growth and profitability of the future sales of its products and services and from obtaining additional financing.

Sales Risks

NuRAN's sales efforts target large corporations that require sophisticated data capture and production execution systems to collect and analyze data relating to various operational activities. NuRAN spends significant time and resources educating prospective customers about the features and benefits of its solutions. NuRAN's sales cycle usually ranges from 3 to 18 months and sales delays could cause its operating results to vary. NuRAN balances this risk by continuously assessing the condition of its sales pipeline and making the appropriate adjustments as far in advance as possible. NuRAN's strategy also includes a comprehensive program to build and improve relationships with long-standing customers to better understand needs and proactively manage incoming business levels effectively.

Foreign Exchange Risk

NuRAN's sales are mainly outside Canada and are generally conducted in currencies other than the Canadian dollar, while a majority of our product research and development expenses, integration services, customer support costs and administrative expenses are in Canadian dollars. Fluctuations in the value of foreign currencies relative to the Canadian dollar can negatively, or positively, impact NuRAN's financial results. The company monitors this risk and will enter/consider entering into forward/ derivatives contracts to minimize the exposure.

Outsourcing Risk

NuRAN outsources the manufacture of its products to third parties. If they do not properly manufacture the products or cannot meet the needs in a timely manner, NuRAN may be unable to fulfill its product delivery obligations and its costs may increase, and its revenue and margins could be negatively impacted. The Company's reliance on third-party manufacturers subjects it to a number of risks, including the absence of guaranteed manufacturing capacity and the inability to control the amount of time and resources devoted to the manufacture of products. To mitigate this dependency, the Company has relationships with two separate manufacturing service providers and maintain contact with additional alternative suppliers in case the primary manufacturing sources should be disrupted.

Competition

NuRAN must contend with strong international competition. Therefore, there are no guarantees that NuRAN can maintain its competitive position. However, its unique mix of products combined with NaaS service delivery, and skilled human resources give it a competitive edge in several markets.

Availability and Cost of Qualified Professionals

The high-technology industry's strong growth as well as the Company's move into the NaaS model increased the demand for qualified staff. So far, NuRAN has successfully met its needs for personnel. NuRAN benefits from its

location in Quebec City, which gives it access to a large pool of engineering resources but has also pursued hiring internationally. Aware that the satisfaction of its customers is directly tied to the quality of its employees, NuRAN continues to take measures to attract and retain well-qualified professionals from a global talent pool.

Ability to Develop and Expand Mix of Products and Services to Keep Pace with Demand and Technological Trends

NuRAN uses several means to remain on the cutting edge and to meet its customers' changing needs—steady investments in product development and improvements, business alliances with major industry suppliers and partners, ongoing training of its personnel and occasional business acquisitions that provide it with specific know-how.

Protection of Intellectual Property

To protect its intellectual property, NuRAN relies on a series of patent and trademark laws, provisions respecting trade secrets, confidentiality protection measures, and various contracts. Regardless of all the efforts made to retain and protect its exclusive rights, third parties could attempt to copy aspects of its products or obtain information regarded as exclusive without authorization. There can be no assurance that the measures taken by NuRAN to protect its exclusive rights will be sufficient.

Dependence on Customers

NuRAN is currently dependent on a limited number of customers for the sale of its products and services. If one or several of these customers should cease doing business with NuRAN for any reason or should reduce or defer their current or planned product purchases, NuRAN's operating results and financial position could be adversely affected.

International Operations Risk

Our international operations are subject to various economic, political and other uncertainties that could adversely affect our business. Since 2014, approximately 40% of our sales were derived from sales outside North America, and economic conditions in the countries and regions in which we operate significantly affect our profitability and growth prospects. The following risks, associated with doing business internationally, could adversely affect our business, financial condition and results of operations:

- regional or country specific economic downturns;
- the capacity of the Company to deliver in a technical capacity and to import inventory at a reasonable cost;
- fluctuations in currency exchange rates;
- complications in complying with a variety of foreign laws and regulations, including with respect to environmental matters, which may adversely affect our operations and ability to compete effectively in certain jurisdictions or regions;
- international political and trade issues and tensions;
- unexpected changes in regulatory requirements, up to and including the risk of nationalization or expropriation by foreign governments;
- higher tax rates and potentially adverse tax consequences including restrictions on repatriating earnings, adverse tax withholding requirements and double taxation;
- greater difficulties protecting our intellectual property;

- increased risk of litigation and other disputes with customers;
- fluctuations in our operating performance based on our geographic mix of sales;
- longer payment cycles and difficulty in collecting accounts receivable;
- costs and difficulties in integrating, staffing and managing international operations, especially in rapidly growing economies;
- transportation delays and interruptions;
- natural disasters and the greater difficulty in recovering from them in some of the foreign countries in which we operate;
- uncertainties arising from local business practices and cultural considerations;
- customs matter and changes in trade policy, tariff regulations or other trade restrictions; and
- national and international conflicts, including terrorist acts.

The percentage of our sales occurring outside of North America will increase over time largely due to increased activity in Africa, Central and South America and other emerging markets. The foregoing risks may be particularly acute in emerging markets, where our operations are subject to greater uncertainty due to increased volatility associated with the developing nature of the economic, legal and governmental systems of these countries. If we are unable to successfully manage the risks associated with expanding our global business or to adequately manage operational fluctuations, it could adversely affect our business, financial condition or results of operations.

Gross Margin May Not Be Sustainable

Our level of product gross margins may be adversely affected by numerous factors, including:

- Changes in customer, geographic, or product mix, including mix of configurations within each product group;
- Introduction of new products, including products with price-performance advantages;
- Our ability to reduce production costs;
- Entry into new markets or growth in lower margin markets, including markets with different pricing and cost structures, through acquisitions or internal development;
- Increases in material, labor or other manufacturing-related costs, which could be significant especially during periods of supply constraints;
- Excess inventory and inventory holding charges;
- Obsolescence charges;
- Changes in shipment volume;
- The timing of revenue recognition and revenue deferrals;
- Increased cost, loss of cost savings or dilution of savings due to changes in component pricing or charges incurred due to inventory holding periods if parts ordering does not correctly anticipate product demand or if the financial health of either contract manufacturers or suppliers deteriorates;
- Lower than expected benefits from value engineering;
- Increased price competition, including competitors from Asia, especially from China;
- Changes in distribution channels;
- Increased warranty costs;
- How well we execute on our strategy and operating plans implementing our new NaaS model.

Changes in service gross margin may result from various factors such as changes in the mix between technical support services and advanced services, as well as the timing of technical support service contract initiations and

renewals and the addition of personnel and other resources to support higher levels of service business in future periods.

Competition Risks

The markets in which we compete are characterized by rapid change, converging technologies, and a migration to networking and communications solutions that offer relative advantages. These market factors represent a competitive threat to us. We compete with numerous vendors in each product category. The overall number of our competitors providing niche product solutions may increase. Also, the identity and composition of competitors may change as we increase our activity in newer product categories such as data center and collaboration and in our priorities. As we continue to expand globally, we may see new competition in different geographic regions. In particular, we have experienced price-focused competition from competitors in Africa and the U.S., and we anticipate this will continue.

Some of our competitors compete across many of our product lines, while others are primarily focused in a specific product area. Barriers to entry are relatively low, and new ventures to create products that do or could compete with our products are regularly formed. In addition, some of our competitors may have greater resources, including technical and engineering resources, than we do. As we expand into new markets, we will face competition not only from our existing competitors but also from other competitors, including existing companies with strong technological, marketing, and sales positions in those markets. Companies with whom we have strategic alliances in some areas may be competitors in other areas, and in our view this trend may increase. Companies that are strategic alliance partners in some areas of our business may acquire or form alliances with our competitors, thereby reducing their business with us.

The principal competitive factors in the markets in which we presently compete and may compete in the future include:

- The ability to provide a broad range of networking and communications products and services;
- Product performance;
- The ability to introduce new products, including products with price-performance advantages;
- The ability to reduce production costs;

- The ability to provide value-added features such as security, reliability, and investment protection;
- Conformance to standards;
- Market presence;
- The ability to obtain financing on reasonable terms;
- Disruptive technology shifts and new business models.

We also face competition from customers to which we license or supply technology and suppliers from which we transfer technology. The inherent nature of networking requires interoperability. As such, we must cooperate and at the same time compete with many companies. Any inability to effectively manage these complicated relationships with customers, suppliers, and strategic alliance partners could have a material adverse effect on our business, operating results, and financial condition and accordingly affect our chances of success. The loss of one or more significant suppliers or a reduction in significant volume from such suppliers

Intellectual Property Risks

We generally rely on patents, copyrights, trademarks, and trade secret laws to establish and maintain proprietary rights in our technology and products. Although we have been issued patents, there can be no assurance that any of these patents or other proprietary rights will not be challenged, invalidated, or circumvented or that our rights



will, in fact, provide competitive advantages to us. Furthermore, many key aspects of networking technology are governed by industrywide standards, which are usable by all market entrants. In addition, there can be no assurance that patents will be issued from pending applications or that claims allowed on any patents will be sufficiently broad to protect our technology. In addition, the laws of some foreign countries may not protect our proprietary rights to the same extent as do the laws of the United States. The outcome of any actions taken in these foreign countries may be different than if such actions were determined under the laws of the United States. Although we are not dependent on any individual patents or group of patents for particular segments of the business for which we compete, if we are unable to protect our proprietary rights to the totality of the features (including aspects of products protected other than by patent rights) in a market, we may find ourselves at a competitive disadvantage to others who need not incur the substantial expense, time, and effort required to create innovative products that have enabled us to be successful.

Third parties, including customers, have in the past and may in the future assert claims or initiate litigation related to exclusive patent, copyright, trademark, and other intellectual property rights to technologies and related standards that are relevant to us. These assertions have increased over time as a result of our growth and the general increase in the pace of patent claims assertions, particularly in the United States. Because of the existence of a large number of patents in the networking field, the secrecy of some pending patents, and the rapid rate of issuance of new patents, it is not economically practical or even possible to determine in advance whether a product or any of its components infringes or will infringe on the patent rights of others. The asserted claims and/or initiated litigation can include claims against us or our manufacturers, suppliers, or customers, alleging infringement of their proprietary rights with respect to our existing or future products or components of those products. Regardless of the merit of these claims, they can be time-consuming, result in costly litigation and diversion of technical and management personnel, or require us to develop a non-infringing technology or enter into license agreements. Where claims are made by customers, resistance even to unmeritorious claims could damage customer relationships. There can be no assurance that licenses will be available on acceptable terms and conditions, if at all, or that our indemnification by our suppliers will be adequate to cover our costs if a claim were brought directly against us or our customers. Furthermore, because of the potential for high court awards that are not necessarily predictable, it is not unusual to find even arguably unmeritorious claims settled for significant amounts. If any infringement or other intellectual property claim made against us by any third party is successful, if we are required to indemnify a customer with respect to a claim against the customer, or if we fail to develop non-infringing technology or license the proprietary rights on commercially reasonable terms and conditions, our business, operating results, and financial condition could be materially and adversely affected. Our exposure to risks associated with the use of intellectual property may be increased as a result of acquisitions, as we have a lower level of visibility into the development process with respect to such technology or the care taken to safeguard against infringement risks. Further, in the past, third parties have made infringement and similar claims after we have acquired technology that had not been asserted prior to our acquisition.

Many of our products are designed to include software or other intellectual property licensed from third parties. It may be necessary in the future to seek or renew licenses relating to various aspects of these products. There can be no assurance that the necessary licenses would be available on acceptable terms, if at all. The inability to obtain certain licenses or other rights or to obtain such licenses or rights on favorable terms, or the need to engage in litigation regarding these matters, could have a material adverse effect on our business, operating results, and financial condition. Moreover, the inclusion in our products of software or other intellectual property licensed from third parties on a nonexclusive basis could limit our ability to protect our proprietary rights in our products.

Risks arising from the COVID-19 pandemic

The recent outbreak of COVID-19, which has been declared by the World Health Organization to be a pandemic, has spread across the globe and is impacting worldwide economic activity. A pandemic, including COVID-19, or other public health epidemic poses the risk that we or our employees, vendors, suppliers and other partners may be prevented from conducting normal business activities at full capacity for an indefinite period of time, including due to spread of disease among our employees, vendors, suppliers and other partners, or due to shutdowns that may be or have been requested or mandated by governmental authorities. The COVID-19 pandemic and mitigation measures are currently having and may continue to have an adverse impact on global economic conditions, which has had and may have an adverse effect on our business and financial condition, including on our ability to obtain financing on terms acceptable to us, if at all. The extent to which the COVID-19 pandemic continues to impact our results will depend on future developments that are highly uncertain and cannot be predicted at this time, including new information that may emerge concerning the severity of the virus and the actions to contain its impact.