Vaccine and Infectious Disease Organization and its Pandemic Research Centre Proposal – Issues for Consideration

ISSUE

The University of Saskatchewan's Vaccine and Infectious Disease Organization (VIDO) is proposing to construct a research laboratory to be called the "Canadian Centre of Pandemic Research". VIDO has approached the City of Saskatoon (the City), along with federal and provincial orders of government, seeking financial support for the project. As a result, what policy considerations should be made to assess whether the City should offer financial support for the proposal?

BACKGROUND

At its November 23, 2020, meeting, the Governance and Priorities Committee (GPC) received a presentation from Dr. Volker Gerdts, VIDO, University of Saskatchewan (UofS), and legal counsel Doug Richardson, McKercher LLP, about the research centre's accomplishments and current work on the COVID-19 vaccine. The presentation also explained VIDO's proposal to construct a Containment Level 4 (CL4) laboratory to enhance its vaccine research. At the conclusion of that presentation, the Committee resolved that: "the Administration research this proposal and report back to GPC by January 2021, and:

- include other projects where municipal contributions have helped to support successful national proposals, including the amount of the City's contribution(s);
- include outreach to proponents from Saskatchewan and Manitoba, the federal government, and the Saskatoon business community;
- where possible, include economic activity and/or spinoffs as a result of previous contributions; and
- coordinate an opportunity for Council to review the full presentation on the project."

At its January 19, 2021, meeting, GPC approved a deferral report from the Administration indicating that the requested report will be on the February 16, 2021, Committee meeting agenda.

CURRENT STATUS

VIDO is in the process of completing two major initiatives with respect to vaccine research and development. First, it has developed a COVID-19 vaccine that is going through the first phase of clinical trials in Halifax to determine its safety and effectiveness. If the vaccine passes the three-phased clinical trial process, it can then receive regulatory approvals for use. This is anticipated for late 2021 or early 2022.

Second, VIDO is building a manufacturing facility that has the potential to produce up to 40 million vaccine doses per year depending upon the production efficiencies of specific vaccines. Construction is expected to be completed in late 2021, with vaccine

production for facility certification planned for 2022. According to VIDO, this will be Canada's only Containment Level 3 (CL3) manufacturing facility and one of a few in the world.

To enhance or complement its existing efforts, VIDO is seeking public and private funding to establish a Canadian Centre for Pandemic Research at the UofS campus. As highlighted in Appendix 1, the objective of this proposal is to invest an estimated $60 million to expand and upgrade its existing facilities so that the organization can undertake research on animal-borne viruses and quickly develop vaccines in response. It has asked the City to contribute $250,000 to the proposal.

According to VIDO, government funding will primarily be used to upgrade key areas of its CL3 facility to the highest containment level, level 4 (CL4). The CL4 space would only be about 15% of the centre's total space. It would double Canada's capacity for dealing with Level 4 pathogens such as Ebola. Currently, there is only one other CL4 lab, which is located at the federally owned National Microbiology Laboratory in Winnipeg.

A similar pandemic research effort was announced in September 2020 at McMaster University in Hamilton, Ontario called "The Global Nexus for Pandemics and Biological Threats". Its objective is to "ensure Canada and the world are better able to manage the human and economic devastation of COVID-19 and avert future pandemics."[1] There is some evidence to suggest that this organization is seeking federal or local government financial support for the project; however, McMaster University did make a submission to the House of Commons Standing Committee on Finance, recommending that "the Government of Canada should focus investments to leverage expertise in infectious disease research to mitigate the risk of future outbreaks, and position Canada as a leader in developing innovative solutions to this global challenge."[2]

DISCUSSION/ANALYSIS

The Context for Vaccine Research and Development

The SARS COV-2 pandemic, more commonly known as COVID-19, has shone a bright spotlight on the need for readily available vaccines. It has shown that in the absence of effective and efficacious vaccines, alternative public health measures are needed to combat the spread of disease and its impacts on human health. Blunt measures such as mobility restrictions, lockdowns, and quarantines, to name a few, have been used to combat the spread of COVID-19. Unfortunately, these measures have generated substantial economic, fiscal, and social consequences for society and governments in Canada and around the world. [3]

[1] For more, please consult https://brighterworld.mcmaster.ca/articles/mcmaster-to-create-and-lead-new-international-nexus-for-pandemics-and-biological-threats/

[2] See for example, https://www.ourcommons.ca/Content/Committee/432/FINA/Brief/BR10974740/br-external/McMasterUniversity-10291617-e.pdf

[3] For an overview of these impacts see Statistics Canada, "The Social and Economic Impacts of COVID-19: A Six-month Update," at https://www150.statcan.gc.ca/n1/pub/11-631-x/11-631-x2020004-eng.htm

In response, governments, research institutions, and private industry have all focused efforts on funding, researching, developing, and deploying vaccines in hopes of eradicating the virus, and thus, reducing or removing strict public health measures.

According to the World Health Organization (WHO) there are currently more than 50 COVID-19 vaccine candidates in trials. In Canada, there are nine vaccines undergoing clinical trials, including VIDO's candidate vaccine. As of February 1, 2020, only two COVID-19 vaccines have been approved for use in Canada: Moderna and Pfizer-BioNTech. However, the Government of Canada has signed agreements with biopharmaceutical firms Medicago, AstraZeneca, Sanofi and GlaxoSmithKline, Johnson & Johnson, Novavax, Pfizer, and Moderna for 358 million doses of COVID-19 vaccine candidates.

To facilitate this, the Government of Canada has allocated over $1 billion, starting in 2020, to support vaccine candidates and biomanufacturing opportunities. Throughout 2020 and early into 2021, the Government of Canada has announced funding for several manufacturing projects[4], including the following:

- Providing $35 million, through Western Economic Diversification Canada, to VIDO to accelerate development of its COVID-19 vaccine candidate and enhance its vaccine manufacturing facilities to the good manufacturing practices (GMP) standards required for human vaccine.
- Investing up to $173 million in Medicago to advance its virus-like particle vaccine candidate and establish a large-scale biomanufacturing facility.

Medicago has a manufacturing facility in Quebec City. It appears to be the only facility of its kind to receive financial support from a City government. In 2015, the City of Quebec provided a discount to the purchase of the land, combined with financial assistance, totaling $6.5 million.[5] It partnered with the Government of Canada and the Government of Quebec who each provided loans of $8 million and $60 million for the Medicago project.

More recently, on February 2, 2021, the Prime Minister of Canada announced additional investments to further COVID-19 vaccine production in Canada, namely:

- The Government of Canada signed a memorandum of understanding with Novavax to pursue the production of its COVID-19 vaccine at the National Research Council of Canada's Biologics Manufacturing Centre in Montréal. This facility received a $126 million investment in August 2020.
- The Government of Canada currently has an agreement with Novavax to purchase up to 76 million doses of the Novavax COVID-19 vaccine candidate.

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and for a global perspective, https://www.oecd.org/coronavirus/en/themes/global-economy and https://www.imf.org/en/Publications/SPROLLs/covid19-special-notes

[4] For a listing of these, please consult https://www.canada.ca/en/innovation-science-economic-development/news/2021/02/backgrounder--government-of-canada-investments-in-covid-19-vaccines-and-biomanufacturing-capacity.html

[5] https://www.lapresse.ca/affaires/economie/201505/19/01-4870698-medicago-nouvelle-usine-de-245-millions-a-quebec.php

- Up to $25.1 million to Precision NanoSystems Incorporated (PNI), a Vancouver-based biotechnology company, to expand its ability to produce ribonucleic acid vaccines and future genetic medicines in Canada.
- Up to $14 million to Edesa Biotech Inc. (Edesa), a biopharmaceutical company based in Markham, Ontario, to advance work on a monoclonal antibody therapy for acute respiratory distress syndrome, which is the leading cause of COVID-19 deaths.

The Prime Minister's announcement did not mention VIDO's recent proposal. However, it did acknowledge VIDO's ongoing efforts by noting that it has received "federal contributions of $46 million in 2020 to help strengthen its COVID-19 research and vaccine development and complete the construction of its pilot scale manufacturing facility to good manufacturing practice (GMP) standard". Thus, the federal government has not formally committed to VIDO's latest proposal, but it is under consideration. More may be known once the federal budget is released in March or April.

Public Policy Considerations

This report does not provide a recommendation on whether City Council should support VIDO's proposal. Instead, it offers policy criteria for Committee to consider in weighing such decisions, especially when providing a fiscal subsidy (or grant) to a project. In the absence of a Council-approved comprehensive subsidy policy, Committee could consider other strategic criteria.

Does it support a Strategic Priority?

Guidance on this question can be found in the City of Saskatoon's 2018-2021 Strategic Plan. This plan includes the goal of Economic Diversity and Prosperity. The description below this goal states, in part, "The City is recognized globally as a centre for education, innovation and creativity….". The section goes on to note that the City is striving to be "globally recognized as a Smart City" and will take actions to "pursue expanding existing and initiating new centres of excellence with appropriate partners". The VIDO proposal appears to align with a strategic priority of Council.

Is it a public good and does it provide collective public benefits?

A public good is said to exist when persons cannot be excluded from an activity (good or service) and when one person's consumption of that activity does not reduce another person's ability to consume it. Vaccines are an example of a public good. Moreover, vaccines generate what are called positive externalities, meaning they have positive effects beyond individuals who get them. They also provide indirect benefits to the unvaccinated because it reduces their risk of getting infected. The collective benefits of immunizations go well beyond mortality and morbidity reductions, as they can be most cost-effective health interventions and help to avoid more drastic public health restrictions. VIDO's proposal appears to generate collective public benefits in two key areas: vaccine research and development, and vaccine production at the proposed facility.

Does the project provide long-term economic, social and/or environmental benefits?

Research and development, technology, and innovation tend to generate long-term economic benefits, especially if capitalization of the research can be made. Organizations in these industries tend to have high labour productivity meaning lower levels of employment to generate output. Wages are above the median and the workforce is highly skilled, with many holding advanced research degrees. VIDO currently has 150 staff with over one third in possession of a PhD.

More specifically, vaccine research and production can provide long-term economic benefits because it may result in disease avoidance or containment. In other words, in the absence of a vaccine, the economic and social costs are high due to the disease mitigation measures, as witnessed by COVID-19. VIDO's proposal has the potential to provide long-term economic benefits.

Another consideration here is the ability to create research clusters and centres of excellence. This is a condition where "interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field that are present in a nation or region".[6]

Research indicates that industries participating in a strong cluster register higher employment growth as well as higher growth of wages, number of establishments, and patenting. Industry and cluster-level growth also increase with the strength of related clusters in the region and can attract a highly skilled workforce. The VIDO proposal has the potential to enhance the presence of research clusters in Saskatoon.

Is the project within the City's legislative and/or operational jurisdiction?

Research and development, post secondary education, and public health—three key areas of where VIDO exists—are activities that are largely within federal and provincial jurisdiction. In other words, the City does not have a direct legislative or operational role to play in these areas.

As noted, VIDO's primary function is infectious disease research and vaccine development; functions that are typically in the domain of the federal-and to some extent-provincial government. It is a public research institution that receives about 60% of its revenue from governments. That said, the City has previously made contributions to UofS projects, including VIDO, that are not within its traditional legislative or operational jurisdiction, namely:

- $2.4 million in 1999 for the construction of the Canadian Light Source Sychrotron;
- $250,000 in 2004 for the construction of VIDO's International Vaccine Centre; and

[6] https://www.isc.hbs.edu/competitiveness-economic-development/research-and-applications/Pages/cluster-studies.aspx

- $4 million in 2017 to support the construction of Merlis Belsher Place. (It can be argued that this project is within the City's jurisdiction although managed and delivered by another public institution.).

Does the proposal generate any additional revenues for the City?
The City generates revenues from three main sources: (a) property taxes; (b) fees and charges; and (c) government transfers. Properties on the UofS campus are largely exempt from property taxation. So, the construction of a new manufacturing facility will not generate any additional property tax revenues for the City. As such, VIDO's proposal does not satisfy this criterion.

Does support for the proposal achieve fairness or generate opportunity costs?
The City is subject to a budget constraint in that it is legislatively required to balance its operating budget each fiscal year. The COVID-19 pandemic has had a negative impact on City revenues, requiring it to secure atypical federal and provincial financial support to help balance its budget. Thus, the question to consider here is whether supporting one proposal necessitates a similar fiscal subsidy to other organizations? What are the trade offs? Can scarce resources be allocated to achieve appropriate outcomes, or can they be used in other ways? That said, the City has provided subsidies to other organizations, either through tax incentives or conditional grants.

FINANCIAL IMPLICATIONS

The submitted VIDO presentation, at Appendix 1, did not make an explicit request for financial support. However, during the presentation representatives did make a verbal suggestion of $250,000. This amount is similar, in nominal terms, to what City Council provided to VIDO in November 2004. The City's 2004 contribution to the project was dispersed over five years and VIDO representatives have suggested that a similar arrangement can be made.

If GPC recommends to City Council that it provide financial support to the project, then a similar disbursement may be possible, subject, of course, to negotiation of a payment agreement between the City and VIDO. Moreover, if Committee elects to offer financial support for the proposal, it should be conditional on confirmation of federal and provincial financial support for it.

NEXT STEPS

Any next steps on this issue are subject to the direction of the Committee. A formal recommendation to City Council is required to facilitate financial support for the project.

APPENDIX

1. COVID-19 Research at VIDO-InterVac: Working for Canadians and Canada's Economy.

REPORT APPROVAL

Written by: Mike Jordan, Chief Public Policy and Government Relations Officer
Approved by: Jeff Jorgenson, City Manager

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