Biigtigong Nishnaabeg FINAL PROPOSAL

Source link : https://biigtigong.com/language/publications/smart-cities-challenge/final-proposal/

Executive Summary

Provide an executive summary of your final proposal, including:

- *Reiteration of the Challenge Statement*
- *Overview of the upcoming nine chapters*

Evaluation criteria

- *N/A*

Executive Summary

Canada is trying to create a smart technology future. Biigtigong Nishnaabeg First Nation is trying to revitalize their indigenous language and culture while preparing their K-12 students for the smart technology future.

By utilizing open source software and results-oriented approaches to facilitate effective online learning, effective online acquisition of their endangered Nishnaabe language, and revitalization of their culture – all as an enhancement to their brick-and-mortar K-12 curriculum delivery model, Biigtigong Nishnaabeg are transforming their youth into better-educated, more employable, better-grounded, and more holistically Nishnaabe people.

The graduates of their K-12 curriculum will be able to nearly-completely understand their Nishnaabe language (which is a first-step on the way to becoming a speaker of *any* human language), will have been educated on the interface of the their Nishnaabe worldview with the STEM subject perspectives, will have had increased involvement in real-world traditional Nishnaabe activities in the territory of the Biigtigong Nishnaabeg, will have experienced increased relationship-building with all community members especially in the context of those traditional activities, will be able to code, to

build and control robots, and will have been educated in the entire exam preparation curriculum of a generally-accepted best-starting point certification to enter the IT working world.

Chapter 1 – Vision

Present your smart cities journey, including:

- *How your final proposal carries through the vision laid out in your Challenge Statement and the outcomes in your application, and provides reasonable justification of any variations*
- *How your outcomes continue to be:*
  - *reflective of the true needs of the community, as demonstrated through a compelling body of data and evidence and extensive resident engagement*
  - *ambitious and achievable*
  - *meaningful for the community and its residents*
  - *well-suited to a smart cities approach*
  - *measurable*
- *Progress towards outcomes that may have been achieved during the finalist phase*
- *Reasons to be selected as a winner*

Evaluation criteria

- *Final proposal carries through the vision laid out in the application*
- *Final proposal is transformative, scalable, and replicable within the community and to other communities in Canada*

Chapter 1 – Vision

Challenge Statement Vision

Our Challenge Statement reads:

By means of active, cross-generational, technology-empowered, real-world participation in the intergenerational transfer of traditional Nishnaabe knowledge through the medium of our language, and the bilingual delivery of

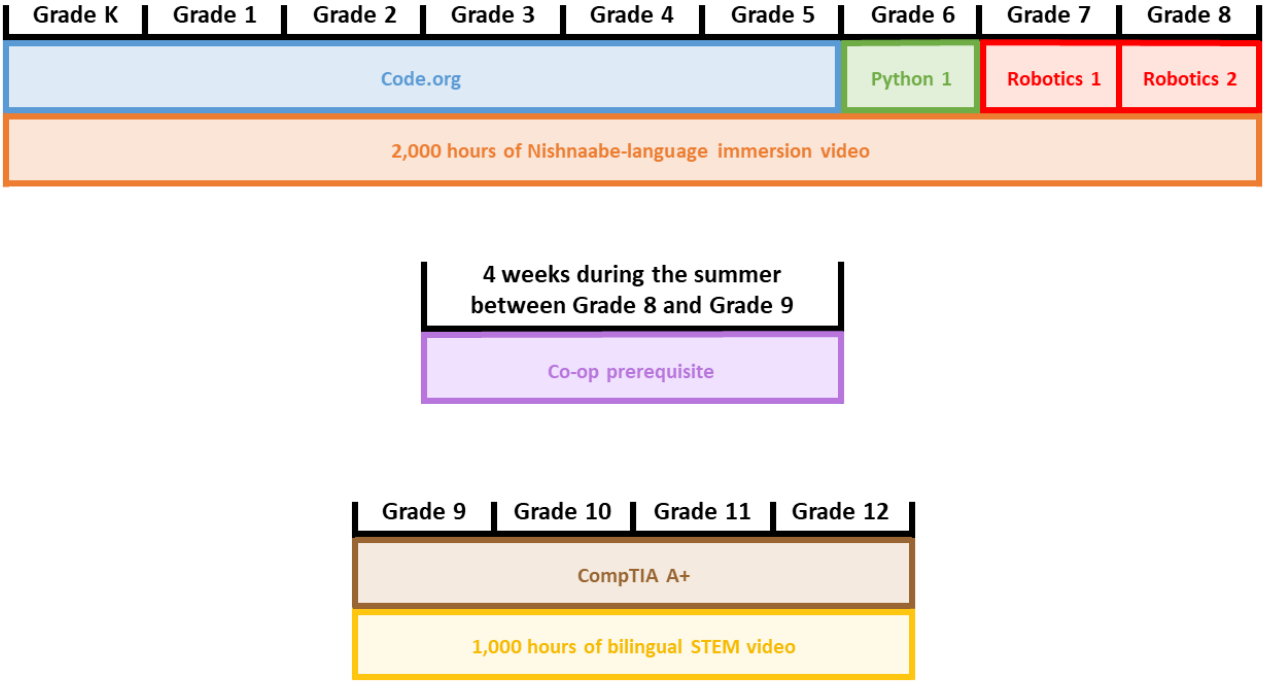
modern K-12 STEM knowledge, our community will transform our youth into better-educated, more-employable, better-grounded, and more holistically Nishnaabe people.

Please see Figure 1-1 for a graphical representation of the “bilingual delivery of modern K-12 STEM knowledge” which we propose in our Challenge Statement.

Outcomes Produced by Carrying Out Our Vision

Our final proposal will carry out the vision of our Challenge Statement and will produce the outcomes laid out in our application.

Figure 1-1: Our bilingual delivery of modern K-12 STEM knowledge. These proposed augmentations to our current K-12 curriculum are partially rolled-out during implementation year 1*, and fully rolled-out at the start of implementation year 2.



** For a rollout schedule of each year of implementation, please see Appendix B.*

Our final proposal seeks to achieve the four outcomes listed in our Challenge Statement:

1. **youth who are "better-educated"** due to
   a. their having successfully completed a greater number of K-12 STEM subjects post-proposal implementation than they successfully completed pre-proposal implementation; and
   b. their increased preparedness for college and university as a result of their having successfully completed a greater number of K-12 STEM subjects post-proposal implementation than they successfully completed pre-proposal implementation;

   This outcome is measurable via these progress indicators:

   - Increase in number of K-12 STEM courses successfully completed by K-12 students, beyond what is currently offered in our K-12 curriculum
   - Decrease in percentage of K-12 students needing remedial help in STEM subject areas

2. **youth who are "more-employable"** in current jobs, as well as in yet-to-be-known types of STEM-related jobs, which require knowledge / expertise in the K-12 STEM subject areas;

   This outcome is measurable via these progress indicators:

   - Increase in number of K-12 STEM courses successfully completed by K-12 students, beyond what is currently offered in our K-12 curriculum
   - Increase in number of K-12 students who have at least a basic ability to code

3. **youth who are "better-grounded" in their Nishnaabe identity** due to
   . their knowledge of our core aadsookaanan; and
   a. their increased participation in our community's traditional Nishnaabe activities;

   This outcome is measurable via these progress indicators:

- Increase in number of K-12 students who know the key concepts expressed in each of our core aadsookaanan
- Increase in number of traditional Nishnaabe activities in which each K-12 student, on average, participates per year

4. **youth who are "more holistically Nishnaabe"** due to
   . their ability to nearly-completely understand our spoken Nishnaabe language; and
   a. their increased participation in our community's traditional Nishnaabe activities; and
   b. their knowledge of the roles of our Nishnaabe worldview in modern technological society

   This outcome is measurable via these progress indicators:

   - Number of hours of Nishnaabe language acquired by graduating eighth-graders is at least 2,000 hours
   - Increase in number of traditional Nishnaabe activities in which each K-12 student, on average, participates per year
   - Number of hours of Nishnaabe-language STEM video successfully completed by graduating high school seniors is at least 1,000 hours

The way in which our final proposal carries out the vision of the Challenge Statement, achieving our four outcomes, is via the following six activities/projects:

1. **"active participation"**

   We mean active in contrast to passive, where active participation includes engaged Khan Academy-style Growth Mindset blended learning pedagogical approaches – approaches which take into account the recent discoveries on how humans beings more effectively learn knowledge in online and hybrid (online and brick-and-mortar, combined) environments; calls to real-world action on our online, mobile-enabled platform (particularly on the eLearning, eAcquisition, and meetup forum functionalities of the platform), online forums, and online community discussions; real-world, hands-on activities undertaken and completed in a

group setting, our youth wrapped in the embrace of the community network; strong encouragement to attend community events, with those community events effectively and articulately made known to all community members via our online forums and discussions.

This activity/project achieves the following outcomes:

- **youth who are "more holistically Nishnaabe."** Community-engagement is a foundational component of our Nishnaabe way of living. Actively participating, not just in social activities – which are, indeed, foundationally important to community vibrancy and individual flourishing – but also being actively engaged in our own learning – both formal and informal – is a key to success in whatever role a Nishnaabe individual plays in the community. Actively participating in the whole of the Nishnaabe community is an imperatively important requisite for one's wellness as a Nishnaabe person.
- **youth who are "better-grounded" in their Nishnaabe identity.** Our Nishnaabe people cannot be only *knowledgeable* of our social norms and ways of being. This knowledge must be *implemented* in one's life in order for one to be a whole Nishnaabe person. Similarly, much knowledge can be obtained through the very act of active participation in one's community. Knowledge and active participation are thus connected. Active participation leads to knowledge. Knowledge, in turn, leads to active participation. In order for a Nishnaabe person, then, to be more knowledgeable – better-grounded – in being Nishnaabe, active participation in the Nishnaabe community is required.

2. **"cross-generational participation"**

Cross-generational participation means not just youth/students, but community members from the entire span of ages, from all generations.

This activity/project achieves the following outcomes:

- **youth who are "more holistically Nishnaabe."** Similar to the reasons given in the above section on the active participation requisite for one's being holistically Nishnaabe, all sectors of our Nishnaabe community must have a space and a place to participate. Each age group brings a diverse set of experiences, gifts, and knowledge to our collective Nishnaabe community, and to the overall wholeness of each of the

individuals within the community. The participation of everyone, from all generations, is required for each of us to be holistically Nishnaabe.

- **youth who are "better-grounded" in their Nishnaabe identity.** We Nishnaabe people believe that everyone – no matter one's age – is a teacher and a contributor to the collective's knowledgebase. Encouraging and ensuring the participation of all generations provides a maximally diverse dataset of experience as knowledge, made available to and learnable by each and every Nishnaabe community member who participates in community events. This cross-generational participation leads thusly to better-grounded Nishnaabe community members.

3. **"technology-empowered participation"**

   Technology-empowered participation refers to engagement with the eLearning and eAcquisition functionalities of the Open edX platform; engagement in Open edX's meetup discussion forums for traditional Nishnaabe activities; online platform discoverability of friends'/relatives' locations and currently-happening traditional activities in order to encourage students to, in like manner, take part in those made-discoverable activities.

   This activity/project achieves the following outcomes:

   - **youth who are "better-educated."** Knowing not just about technology, but being – and being comfortable – in a technology-oriented mindset, versed in the social expectations and norms of this modern way of interacting with our technological world is prerequisite knowledge and an imperatively important education to have. Just being able to navigate this brave new world of technology is a plus on one's curriculum vitae, and our proposal's implementation will yield for our Nishnaabe youth exactly that: a better education through the experience of successfully participating in this new technology as a means to better one's self educationally.
   - **youth who are "more employable."** The technology-empowered participatory tools – the rules of online community engagement – that will benefit our Nishnaabe youth are, in many cases, the precise job skills required to even be considered for a job interview. Online forum etiquette, respecting boundaries of online relationships, being responsive to and responsible for timely replies to online community engagement requests and relationships, and a host of other modern

technological communication social norms – the very skills and education that our proposal will instill in our Nishnaabe youth – are what will help prepare our Nishnaabe youth to be effectively and productively employed in today's – and the future's – job market.

4. **"real-world participation"**

   Smart technology is an enabling factor, a factor which enables real-world participation – not just online participation, but participation in the real, material world. The world of touchable human beings, hugs, babies, tears, family, and love. Our proposal intends to implement this technology to facilitate and encourage participation in real-world community events.

   This activity/project achieves the following outcomes:

   - **youth who are "more holistically Nishnaabe."** Being Nishnaabe means being community-oriented. Participating and being an active, contributing part of the lives of those whom we are networked within our territory is a requirement of our communal approach to effective and productive existence on this earth. Participating in the real world, the material world, of our Nishnaabe community is thus a requirement of being a whole Nishnaabe.
   - **youth who are "better-grounded" in their Nishnaabe identity.** Being better grounded means being better educated. And being better educated happens, in part, by being around the educated and knowledgeable ones. For Nishnaabe people, all activities are a teaching opportunity – and thus a learning opportunity. Being out and about in the community leads naturally to discussions with people more knowledgeable than us, which in turn leads to becoming more knowledgeable ourselves – more educated, and thus better grounded.

5. **"intergenerational transfer of traditional Nishnaabe knowledge through the medium of our language"**

   Our proposal aims to produce 2,000 hours of Nishnaabe-language immersion video, the content of which will be our core aadsookaanan (our sacred stories, our philosophical foundations, the building blocks of our worldview). Our aadsookaanan are, in part, the imperatively important

intergenerational knowledge which has been passed on – in story form – for countless generations. The acquisition – language *acquisition* (subconscious) in contrast to language *learning* (cognitive) – of 2,000 hours of a target language yields an individual who can nearly-completely comprehend that target language. The target language in this case is our Nishnaabe language, and it is with this 2,000 hours of immersion video of our aadsookaanan that we intend to create understanders of our Nishnaabe language – understanders who can then go on to successfully complete 1,000 hours of STEM subject non-immersion video (i.e., what we usually refer to in this proposal as 'bilingual STEM video'), the audio of which is delivered in our Nishnaabe language.

This activity/project achieves the following outcomes:

- **youth who are "more holistically Nishnaabe."** Being a whole Nishnaabe requires that one be a speaker of one's Nishnaabe language. While this proposal is not big enough to facilitate that particular outcome, becoming an understander of our Nishnaabe language is, indeed, attainable within the timeframe of this proposal. And, since we are aiming for "more" holistically Nishnaabe, becoming an understander of our Nishnaabe language fits the bill quite nicely. Two points here: (1) being able to understand one's indigenous/heritage language, for a member of any culture, seems obviously contributory to one's being more holistically of that culture and identity; and (2) walking around in the world with a headful of knowledge that got into one's head via a foreign language does not make for a very "holistically Nishnaabe" person. While knowledge and education are important in their own right, it is more holistic for that knowledge and education to have entered one's head in the medium of one's own indigenous/heritage language. So, our youth being able to understand our Nishnaabe language which in turn makes possible their learning content of a modern K-12 STEM curriculum delivered in the medium of our Nishnaabe language is a powerful contributor to their becoming more holistically Nishnaabe.
- **youth who are "better-grounded" in their Nishnaabe identity.** Knowing about one's cultural identity is self-evidently important to one's wholeness. But, knowing the main tenets of the core philosophies of one's culture is absolutely key to one's being well versed in the oral/written stories/literature of one's culture – especially when one considers the importance of learning this information through the medium of one's language. Learning the main ideas expressed in our Nishnaabe aadsookaanan, through the medium of our Nishnaabe

language, produces Nishnaabe youth who are more knowledgeable of, thus better-grounded in, their Nishnaabe identity.

6. **“bilingual delivery of modern K-12 STEM knowledge”**

This activity/project refers to the combination of our English-language K-12 STEM curriculum and the 1,000 hours of bilingual (Nishnaabe-language and English-language) STEM video. Please see Figure 1-1 for a graphical representation of this post-augmented curriculum. Our bilingual STEM video will, in part, teach our grade 9-12 students about the role of our Nishnaabe worldview in modern technological society. In particular, our bilingual STEM video will show that there is no conflict in the explanations provided by modern-day STEM and our Nishnaabe worldview. More specifically, our bilingual STEM video will enlighten our students about the relationship between the teachings of our aadsookaanan (which we can refer to with more culturally-neutral terminology as ‘allegorical narratives,’ or simply ‘mythology’) and STEM: the role of science is to explain/show/teach what *is*; the role of mythology is to explain/show/teach *why* (metaphysically why) something is.

For example, the scientific explanation of lightning and thunder (that lightning is a huge electrical discharge that flows between clouds, from a cloud to air, or from a cloud to the ground; and that thunder is in turn caused by lightning), and our Nishnaabe worldview explanation of this same phenomenon (that thunder beings are engaged in an eternal battle with the great underwater lynx; an allegory for the eternal battle between good and bad). Only in modern times have these two traditions (i.e., mythology and science) been viewed by some as ‘in conflict,’ or ‘in competition.’ Historically, however, throughout the world’s indigenous societies, at least, mythology has made science more culturally fitting – not tried to compete with, nor replace the role of, science.

Mythology has *not*, historically, tried to do the work of the STEM fields. Mythology and STEM have, historically, been partners in explaining the world around us in a culturally-appropriate – and usually quite poetic – manner. In similar fashion, this is the function of our bilingual STEM video, and the role of our bilingual delivery of modern K-12 STEM knowledge, in general: to explain the scientific, material world around us in a culturally-appropriate – and usually poetic – manner. This activity/project achieves

the following outcomes:

This activity/project achieves the following outcomes:

- **youth who are "better-educated."** The need of this generation of K-12 students for a solid STEM subject area education is undeniable. One need only browse the course descriptions or syllabi of almost any college/university curriculum to find the very long list of requisite technology, math, science, programming knowledge for those majors and academic program paths. Providing our youth with thirteen years of a modern, K-12 STEM curriculum will provide them with the tools, knowledge, and mindset to succeed in the increasingly demanding curriculum of this modern technologically-driven world.
- **youth who are "more employable."** For reasons similar to the ones given in the above paragraph, our youth who have successfully completed our bilingual, modern K-12 STEM curriculum will not only be better prepared for college and university. The college and university curriculums are being designed, in part, to produce graduates who are more employable in this technologically-driven world and job market. Our youth, having completed such solid preparation as provided for them by our K-12 STEM curriculum, will thus be more employable. And, not only after college/university; but, also in the high- school graduate job market, as well.
- **youth who are "more holistically Nishnaabe."** One's having been educated in a particular subject area is an accomplishment on its own. Having been educated in a particular subject area in the medium of one's indigenous/heritage language, with that education couched in the worldview and perspective of one's mythology and culture, is an even greater accomplishment; and, an accomplishment contributing greatly to one's wholeness as a member of that language community.

The achievement of our six activities/projects, and their consequent four outcomes, are enabled by the creation of an online, mobile-enabled platform able to carry out the following three functions. We have chosen the Open edX platform for this purpose. (While we originally envisioned having three separate platforms/applications for each of the three functions, we have, during the finalist phase, opted to wrap all three of these functions into one 'Learning Management System' (LMS) platform, namely Open edX.) Open edX is open source software and facilitates the production of materials to be made available under a Creative Commons license. The three functions being

fulfilled by the Open edX platform are:

1. **eLearning.** Mobile-enabled eLearning functionality is built into Open edX with open source technologies and languages, enabling interoperable, scalable, and replicable results by any other community or organization choosing to implement a similar platform. eLearning functionality will facilitate the collection of real-time data on all aspects of community-based, online, collaborative learning, and the storage of that data in an open source database backend enabling other departments and organizations within our Biigtigong Nishnaabeg community to seamlessy access and utilize this data.
2. **eAcquistion.** Mobile-enabled eAcquisition functionality will be nearly identical to our eLearning functionality, but will have the added responsibility of enabling the effective acquisition of our Nishnaabe language. As our community makes a strong distinction between language *learning* (a conscious, cognitive process) and language *acquisition* (which occurs subconsciously), we need to keep these two functionalities independent of each other so that each one's unique pedagogical approach can be implemented effectively.
3. **meetup forum.** Mobile-enabled meetup forum functionality will serve as the central 'online gathering' place which will facilitate the bridging and interfacing of the digital world with the material, real world. All community members will have access to each other via this online gathering place. This functionality within Open edX is where our youth who are hoping to attend a particular traditional Nishnaabe activity can express their interest to do so. Other community members then have the ability to invite our youth along to that event. Likewise, community members who are planning an activity can now express their intentions in the meetup forum functionality of Open edX thereby providing additional options for our youth to take part in while remaining in the embrace of the real-world community network.

Data: Outcomes are Reflective of True Needs of Community

Our outcomes are reflective of the community needs. We conducted extensive community engagement sessions throughout the development stage of our proposal. These sessions were aimed at specific stakeholders and the community at large, including our off-reserve members. Through presentations, discussions, surveys, small group meetings, family meetings,

luncheons, social events, we successfully engaged a large number of our community. 221 unique members attended at least one of our engagement sessions and 121 individuals completed our extensive community survey. Chapter 6 provides the findings from our engagement sessions and how community input improved our proposal.

Outcomes are Ambitious and Achievable

Firstly, there exist extremely high unemployment rates for our youth, independent of industry. When we consider only the STEM fields, these unemployment rates for our youth are absurdly high. Our proposal will help to alleviate this.

Secondly, this proposal will move Nishnaabe people from being mainly passive consumers of technology to being active, effective STEM-educated administrators, managers, and users of data and connected technology who are able to achieve meaningful outcomes for themselves, their community, and other communities.

Thirdly, our outcomes are ambitious because we, similar to other Nishnaabe/indigenous communities, have only one high-proficiency first-speaker of our dialect. A survivor of the Canadian Indian residential school system, she is 82 years old. We have only another two medium proficiency first-speakers of our dialect. They are both in their 70s. When they leave, so will our dialect.

So, over the last five years, we have been hurriedly working with a high-proficiency second-language speaker of a related dialect. He has spent the last five years working with our elders to reconstruct our dialect. (Our Biigtigong dialect's noun declension charts, verb conjugation charts, and dictionary are all currently available on our language website, biigtigong.com, under a Creative Commons license). He is now able to 'grammar bridge' into our Biigtigong dialect from the dialect which he originally acquired; he is thus able to speak and write in our Biigtigong dialect. It is his Nishnaabe-language audio which will be heard on all 3,000 hours of video which our proposal aims to produce.

It is important for us to note here that the method which he used to become a speaker of the Nishnaabe language – he began acquiring the Nishnaabe language almost 20 years ago when he was in his 30s – is the very method of second language acquisition that we're using in our proposal to transform our Biigtigong youth into understanders of our dialect.

Whether we consider the Royal Commission on Aboriginal Peoples, the work of the Truth and Reconciliation Commission, the United Nations Declaration on the Rights of Indigenous Peoples, or that the United Nations General Assembly has declared 2019 the International Year of Indigenous Languages (IYIL2019), we have before us – "us" being Canada and we Biigtigong Nishnaabeg – an ambitious *opportunity*, indeed. An opportunity to move forward. Together. As partners. Collaboratively, we can produce the means by which Nishnaabe people can *forever* be able to become understanders (on their way to becoming speakers) of the Nishnaabe language. That's pretty ambitious.

Our outcomes are achievable because a community such as ours, Biigtigong Nishnaabeg, who has for many, many generations been healing, repairing, reconstructing, and unendingly facilitating the education and holistic Nishnaabe being of each and every one of our community members, as a collective unit, as a community, is quite the solid foundation on which to implement this proposal. The outcomes sought by this proposal are quite achievable, indeed.

Outcomes are Meaningful for the Community and Residents

Our proposal has been met with overwhelming support from our community since the very start of our Smart Cities journey. Biigtigong Nishnaabeg has been working on the revitalization of our language and aadsookaanan many years before we started work on this Smart Cities Challenge. Our Smart Cities final proposal further facilitates profoundly meaningful goals of the community which were set in motion decades ago.

Our chief, Duncan Michano, has, for many years, shared with a great number of people his vision of educating our youth in the ways of physics, engineering, quantum mechanics, computer science, and coding. There has been a marked increase in the community's excitement around these conversations in the last four or five years in particular. Especially for our

young Nishnaabe people. (For example, we already have elementary school-age kids in our community who have gone off to earn a certificate in LEGO Robotics and Programming offered by the Digital Media Academy at University of Toronto.)

Our children and youth have always been the center of our Nishnaabe society. They are, in a very real way, our future. They carry our entire ancient past, and our ongoing present, into the unknown, the future. It is difficult for our community to imagine something *more* meaningful than the betterment of our youth in this modern technological society while helping them to carry with them, as they move forward into the future, our Nishnaabe language and our Nishnaabe worldview.

The outcomes of our final proposal are, *indeed*, meaningful for our community and our residents.

Our Proposal is Well-Suited to a Smart Cities Approach

Our proposal is very well-suited to a smart cities approach.

Smart Cities Approach Principle: Openness

By making our language accessible for the first time through an online platform that can be accessible by anyone at anytime. We will also provide a model for integrating immersion education and STEM education into a standard curriculum. K-12 STEM learning can augment immersion-based cultural learning and immersion-based cultural learning can augment K-12 STEM learning.

By preserving as *open* data, a subset of our language in a certain format (i.e., in the format of *understandable* language which is able to produce understanders of our language after 2,000 hours of viewing), we not only facilitate the survival and thriving of our language into the future, we are also providing a model for other First Nation communities – as well as other communities and groups – to do the same. This initiative will strengthen the relationship between residents and government and public organizations and will help to fulfill Canada's goal of reconciliation with First Nation communities.

Smart Cities Approach Principle: Integration

Currently, our language and aadsookaanan are at risk of being lost. Through the use of connected technology, and by recording this data – including much of our raw cultural data being preserved/made available on Open edX – we are ensuring that our community knowledge is maintained for our Biigtigong Nishnaabeg generations to come, for the benefit of Canadians, and for the benefit of the world. By this democratization of cultural knowledge, we are thus breaking down silos that exist even in our traditional societal structures. Similarly, modern-day administrative and learning management roles of K-12 teachers, of parents, of elders, and of governmental leadership, are also all further facilitated by the increase in frictionless availability of data made possible via the removal of data silos.

Smart Cities Approach Principle: Transferability

We have provided an open source, standardised, and transparent approach to integrating immersion-based cultural education and STEM education into any school curriculum – all of the videos we are producing can be overdubbed in any other language. The approach to building community capacity, through embracing language, culture and STEM can be replicated across the country regardless of a community's size or resources.

This approach is not limited to one language only. The language in question could also be Cree, Mohawk, French, or Italian, for example. There may be a need across the board – in perhaps most, or even all, cultures – to augment STEM learning with language-based cultural education; a need to combine, merge, and interface the digital connections with physical community. In our approach in this proposal, the meetup facilitation functionality of Open edX achieves this. Our proposal moves us into the future by embracing and continuing to facilitate the merging of the digital-world and the real-world in order to create a *truly* smart city that uses data, digital connection, and an online platform to enable intergenerational transfer of knowledge – both traditional language and STEM knowledge and education – education to create better-educated, more employable, better-grounded, and more holistically Nishnaabe(in our case) people.

Our approach is suitable for communities of any size, any location, any level of resources, and is easily replicable and scalable. We see our proposal as an ideal 'onboarding' approach for any community – almost regardless of access to technology-trained staff – to a more STEM-infused culturally-

based/appropriate/infused community. Implementing the bleeding-edge STEM technologies – as a first step – is not, in our opinion, viable for many communities.

The approach we are taking – and advocating for – in our final proposal is not unlike the strategy of early-years Netflix as that company disrupted the DVD-rental industry. Netflix's secret weapon in their successful venture? The post office! Not the most modern of 'technology,' to say the least. While Netflix, of course, employed a host of other approaches and tactics, beyond its utilization of the post office, the company's achieved outcomes are still remarkable given the common 'technology' they employed. We view our smart cities final proposal in a similar light. We have deliberately chosen to deliver *bleeding-edge, four-star quality*outcomes by utilizing *common* smart technology, instead of delivering *common* outcomes by utilizing *bleeding-edge, four-star quality* smart technology. We believe that this approach will maximize the replicability of our approach – and the spread of smart technology – across Canada.

Our proposal is an onboarding approach to smart cities. Not every community has the resources, staff, equipment, Wi-Fi access, etc. to implement cutting-edge smart technology. There is a need to build STEM *knowledge* first, through the method developed in our proposal. What good are sensors and data collection if we do not have the knowledge and appropriate cultural lenses to extrapolate meaning from them? Creating a digitally-literate population is, in our opinion, absolutely essential to ensuring long- lasting smart cities – not just a fad technology that is used for a short period of time.

Lasting and impactful community change, through STEM education, and reconnection with culture through language, along with the use of common, newbie-friendly smart technology is of key importance in the overall strategy of facilitating transferability. Our approach to integrating STEM education into a K-12 curriculum is, indeed, transferable; it can be implemented in any school across the country.

Smart Cities Approach Principle: Collaboration

This technology will enable cross-generational and cross-cultural collaboration as we build a future of digitally-literate and more culturally whole youth who will lead the smart cities of tomorrow across Canada.

Progress During Finalist Phase

Progress toward our outcomes has already been achieved during the finalist phase. We:

- organized and facilitated community consultation events, each with a particular community sector focus
- implemented some changes in organization structure: established teams, roles and responsibilities, etc.
- begun several pilot projects: story writing; aadsookaanan reconstruction; and Waawaa video production
- utilized community surveys to determine several baselines
- set up a framework for data collection and baseline measurement of progress
- produced prototypes of immersion video overdubbed with audio of Biigtigong's dialect
- developed some tools to assess staff training needs
- researched approaches to and formalized a framework for the reconstruction of our aadsookaanan
- successfully piloted Makey Makey, Scratch, and Code.org at our elementary school
- formalized our partnerships
- continued our community engagement sessions with our off-reserve and on-reserve members
- piloted with our elementary school staff and students a sampling of online classes
- further developed the interfacing of our Nishnaabe approach to learning and the Growth Mindset Approach
- continued 'Waawaa' immersion video production, evaluation, and instructor professional development

Chapter 2 – Performance measurement

Winners will receive their prize money through an outcomes-based contribution agreement with Infrastructure Canada. Payments will be triggered by the successful achievement of progress toward outcomes, tailored to the requirements of each winning project. In other words, payments will not be linked to the reimbursement of eligible costs. This chapter serves as the foundation of this outcomes-based contribution agreement.

Appendix 2 (page 24) provides a detailed guidance on outcomes-based performance measurement.

Provide an outcomes-based performance measurement plan for the implementation phase, including:

- *Project activities and their links to outputs and outcomes*
- *Project timelines, deliverables, and milestones that are ambitious yet attainable*
- *Payment schedule with amounts that are reasonable and rational in the context of project timelines, deliverables, milestones, and prize category*
- *Qualitative and quantitative performance indicators and related data sources that are meaningful and can measure short, medium, and long-term progress towards outcomes*
- *Monitoring, reporting, and evaluation strategies and checkpoints for contingencies and course corrections, if necessary*
- *Identification of risks and development of appropriate mitigation strategies*
- *Other details, as required*

Evaluation criteria

- *Plan is detailed, complete, feasible, and well-suited to achieve the outcomes*
- *Plan forms a solid basis for development of outcomes-based contribution agreement*
- *Risk strategy is thorough and adequately addresses key risk*

Chapter 2 – Performance measurement

Strategy

An outcome-based performance approach is a results-based management tool that can be used to guide the selection, development and ongoing use of performance measures. For this project, this strategy will be adopted, which will enable the project team to continuously monitor and assess the results of programs as well as make informed decisions and take appropriate mitigation actions should they be required. A success outcome-based performance measurement strategy will also provide effective and relevant departmental reporting on the program and ensure that credible and reliable performance data is being collected to effectively support evaluation.

Approach

The key to achieving the desired outcomes of this project is to set clearly defined goals which are achievable for the timeline of this project. This will involve defining metrics that can be set to clearly measure the project's success, as well as to identifying any deviations which can then be quickly remedied. The metrics to be used for this project will follow the SMART methodology for goal setting, as defined below:

1. The set outcomes of this project are ***Specific***

   The desired outcomes for this project are clear, well defined and based upon the specific requirements for the completion of this project.

2. The set outcomes of this project are ***Measurable***

   Metrics have been developed to measure the progress of this project. The project team will use these metrics to assess levels of project completion and identify any deviations.

3. The set outcomes of this project are ***Achievable***

The set outcomes of this project were developed by assessing and interpreting relevant data and by receiving input from various experts in relevant fields.

4. The set outcomes of this project are ***Relevant***

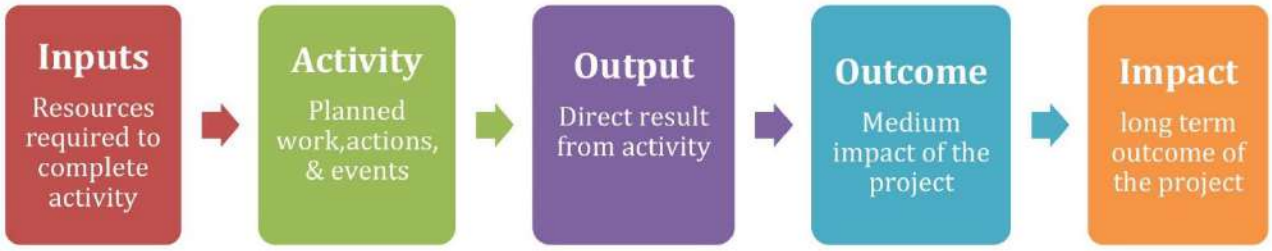
   The defined outcomes of this project are essential for the overall success of the project and were developed by pinpointing the specific needs of the project and by having discussions and input from stakeholders.

5. The set outcomes of this project are ***Time-Bound***

   The outcomes of the project have set target dates for completion based upon required inputs, activities and outputs.

Logic Model for Performance Measurement

A basic logic model will also be used to understand the process of measuring each metric's impact throughout the project. As shown below performance measures can be depicted linearly, however, it is important to note that for each input and relative activity there will be short, medium and long-term results.



As part of developing our measurement approach, the project team completed a resource assessment which has resulted in the identification and classification of the project's inputs. The project team has also developed an implementation plan for the activities required to achieve the desired outcomes and impacts. Each of these activities has an associated immediate output which will then result in the desired outcomes and impacts that are

essentially the goals of our project. Further details on the aforementioned activities (resource assessment, implementation planning, and objective/outcome setting) are included in the Project Management Plan, presented in Chapter 3. The project specific components of the above logic model are summarized in the following sections:

Inputs:

Project Inputs can be defined as financial and non-financial resources used to complete project activities, produce outputs and achieve outcomes. Our project inputs include, but are not limited to, the following:

- Project team members (Chief and Council, Elders, Subject Matter Experts, Project Manager)
- Teaching Staff
- Procured software and technology (i.e. code.org curriculum, Open edX platform, etc.)
- Financial Contributions

Activities:

Project activities can be defined as the planned work, actions, and events that our project team will undertake to produce one or more outputs. The activities to be undertaken as part of this project include:

- Record written aadsookaanan (sacred stories)
- Produce Waawaa video
- Overdub videos in our Nishnaabe language
- Produce STEM videos
- Implement K-12 curriculum augmentation
- Upload all data and materials to Open edX

Outputs:

Outputs can be described as the direct result of the planned activities.

- Recordings of aadsookaanan (sacred stories)

- 2,000 hrs of immersion video
- 1,000 hrs of STEM video
- STEM curriculum framework and materials
- Digitized publicly accessible version of the above

Outcomes:

Outcomes can be described as the medium-term impact of the project.

- Increase in number of K-12 STEM courses successfully completed by K-12 students
- Decrease in percentage of K-12 students needing remedial help in STEM subject areas
- Increase in number of K-12 students who have at least a basic ability to code
- Increase in number of K-12 students who know the key concepts expressed in each of our core aadsookaanan
- Increased annual participation rate in number of traditional Nishnaabe activities for K-12 students
- Minimum 2,000 hours of Nishnaabe language acquired by graduating eighth-graders
- Minimum 1,000 hours of Nishnaabe-language STEM video successfully completed by graduating high school seniors

Impact:

Impacts can be described as the long-term outcome of the project. For the Biigtigong Nishnaabeg Smart Cities project this includes impacts to our community as well as to society as whole, as described below:

Community Impact:

- Youth who are “better-educated”
- Youth who are “more-employable”
- Youth who are “better-grounded” in their Nishnaabe identity
- Youth who are “more holistically Nishnaabe”

Social Impact:

- Preserved language
- Preserved cultural teachings
- Model for connecting STEM, and traditional/cultural learning
- Onboarding approach to creating Smart Cities regardless of current resources or capacity.

Indicators and Milestones:

Key Performance Indicators (KPIs) allow project managers to gauge whether the planned activities have been successful. This is measured by how well they have been able to meet the objectives of the project. The four (4) main objectives for the project have been outlined in Chapter 3. The completion of the activities outlined in the implementation plan for this project should satisfy the objectives of the project and should bring tangible value added to the community and society as a whole.

It is important to have both qualitative and quantitative indicators for tracking, measuring and evaluating performance, to capture the holistic perspective of the project goals. It is also important to select a reasonable number of indicators to ensure that performance measurements are met and accomplished, while not over specifying and removing opportunities that may evolve throughout the project lifecycle.

Quantitative Key Performance Indicators (KPI):

The following section outlines some of the KPIs identified for the performance measurement process of our project. This section details the KPI, the data source and associated responsible resource. The table following this section summarizes this information in the context of associated outputs, outcomes, and target completion dates.

1. Number of aadsookaanan lessons created
2. Number of hours of video produced
3. Number of courses for which curriculum is implemented

The above KPIs are designed to track performance with respect to the outputs for this project. Data will be provided in the form of a summary report to be submitted by the SMEs to the project manager who will then report to the advisory committee on a biannual basis.

4. Number of K-12 STEM courses successfully completed by K-12 students
5. Percentage of K-12 students needing remedial help in STEM subject areas
6. Number of K-12 students who have at least a basic ability to code
7. Number of K-12 students who know the key concepts expressed in each of our core
   aadsookaanan
8. Annual participation rate in number of traditional Nishnaabe activities for K-12 students

Qualitative Key Performance Indicators:

1. Teacher feedback and opinions
2. Student feedback and opinions

Other Key Performance Indicators

In addition to the specific KPIs that the project team has identified for tracking performance on specific project outputs and outcome, all outputs will also be evaluated through implementation of financial- and schedule-based KPIs. Financial- and Schedule-based KPIs for reporting on outcomes are less reliable and therefore these KPIs will only be associated with the following project outputs:

1. Estimated Budget vs. Actual Expenditures (Financial)
2. Target Completion Date vs. Actual Completion Date (Schedule)

Source of Data and Reporting Role and Responsibilities

With respect to tracking the Key Performance Indicators listed above, much of the data required including; participation rates, hours of aadsookaanan and

STEM video developed, student grades etc. can be collected directly from the open-source online Open edX platform. clear and concise reporting of the Key Performance Indicators will also be a vital component when measuring the progress made throughout this project.

Since teaching staff will be responsible for the direct oversight of students' engagement with the curriculum (i.e. grading), they will play a large role in assessing and reporting on the performance of students and the quality of educational materials developed. Reporting of these performance indicators will then be communicated to the project team for further analysis. The project team will be responsible for tracking their internal performance, regarding budgeting and scheduling.

Program Outputs and Outcomes	Indicator	Data Source	Frequency	Baseline	Target	Date to Achieve Target	Data Collection Resource
Output 1 Record of aadsookaanan (sacred stories)	# of aadsookannan lessons created	Report from Elders and Project Team	Bi-annually	0	50	August 2024	SMEs – Elders &Project Manager
Output #2 – Immersion Video	# of hours of video	Report from Video Production Team	Bi-Annually	0	2,000 hrs	August 2024	SMEs - Video Production Team & Project Manager
Output #3 – Billingual STEM Video	# of hours of video	Report from Video Production Team	Bi-Annually	0	1,000hrs	August 2024	SMEs - Video Production Team & Project Manager
Output 4 - STEM curriculum framework and materials for k-12	# of courses for which curriculum is implemented	Teaching Staff and SMEs	Bi-Annually	No Grades	Grades K-12	August 2024	Teaching Staff
Outcome 1: Youth who are "better-educated"	• # of K-12 STEM courses successfully completed by K-12 students • % of K-12 students needing remedial help in STEM subject areas • Teacher opinion (qualitative) • Student opinion (qualitative)	Summary Report from Teaching Staff	Bi-Annually	None	Increase	August 2024	Teaching Staff
Outcome 2: Youth who are "more-employable"	• # of K-12 STEM courses successfully completed by K-12 students • # of K-12 students who have at least a basic ability to code • Teacher opinion (qualitative) • Student opinion (qualitative)	Summary Report from Teaching Staff	Bi-Annually	None	Increase	August 2024	Teaching Staff
Outcome 3: Youth who are "better-grounded" in their Nishnaabe identity	• # of K-12 students who know the key concepts expressed in each of our core aadsookaanan • Annual participation rate in number of traditional Nishnaabe activities for K-12 Students • Teacher opinion (qualitative) • Student opinion (qualitative)	Summary Report from Teaching Staff	Bi-Annually	None	Increase Reach and obtain Positive Opinion Feedback	August 2024	Teaching Staff
Outcome 4: Youth who are "more holistically Nishnaabe"	• Minimum 2,000 hours of Nishnaabe language acquired by graduating eighth-graders • Annual participation rate in number of traditional Nishnaabe activities for K-12 Students • Minimum 1,000 hours of Nishnaabe-language STEM video successfully completed by graduating high school seniors • Teacher opinion (qualitative) • Student opinion (qualitative)	Summary Report from Teaching Staff	Bi-Annually	None	Increase Reach and obtain Positive Opinion Feedback	August 2024	Teaching Staff

Payment Schedule

Understanding that the intent is to develop an outcome-based contribution agreement with Infrastructure Canada, where payments will be triggered by the successful achievement of progress toward outcomes, we have developed a payment schedule that is simple, manageable and associated with the completion of milestones as outlined in detail in Chapter 8.

Risk Management

Identifying risks that may be presented throughout the project lifecycle is an essential component of project management as it allows the project team to proactively establish mitigation strategies to effectively minimize the impact of the risk on the project before it occurs. The table below summarizes a list of potential risks related to the above Key Performance Indicators, as well as the associated mitigation strategies that will be implemented to ensure that the delivery of this content remains effective, up to date, and on schedule.

Risks	Mitigation Strategies
Lag in completing activities could negatively impact project outcomes	Project implementation plan includes Ramp-Up strategy to capitalize on efficiencies in activities
Lack of Student Participation	Incorporation of Immersion and STEM education into existing curriculum provides double-duty lessons to ensure student involvement
Difficulty with Curriculum Implementation	Ramp-up capabilities of Code.org (for example) means that students can be exposed to coding in Grade 5 only, and still proceed to Python in Grade 6, and Robotics in Grades 7 and 8. In other words, the first few years of K-5 curriculum implementation has a significant buffer to include all experience and skill levels. With respect to Grade 6 and above, and experience or previous coding exposure is an improvement on the current curriculum. By the end of the 5-year implementation period, it is expected that any obstacle associated with curriculum implementation will be overcome.
Resources (Human or Technological) are no longer available	Only a few language speakers and Elders can produce aadsookaanan. This highlights the critical nature of this project. The likelihood of any human resources no longer being available is very low, but the impact if this is the case would be significant.
Curriculum becomes outdated	Reliance will be placed on existing websites for STEM education (i.e. code.org). As these are established organizations, that are constantly updating and revising content to better engage youth and other users in this field, there is little chance that this curriculum will become dated. However, SMEs will continuously monitor content and explore alternatives should the desired content become outdated or unavailable.

Chapter 3 – Project management

Winners will likely have more than one project associated with their final proposal for each outcome, and multiple activities for each project. Many of these projects will have a technology component though some will not. This chapter serves as a step-by-step outline of your project management approach, and provides context for the other chapters that follow on technology, governance, engagement, data and privacy, and finances.

Provide a project management plan for the implementation phase, including:

- *Project scope, scheduling, sequencing, and dependencies*
- *Resource assessment, including human, materiel, and financial (e.g. workforce capacity, infrastructure readiness, and related initiatives already underway) that are sufficient and appropriate to the achievement of outcomes*
- *Strategies for:*
  - *Risk identification and appropriate mitigation*
  - *Procurement, including alignment with technology and partnership requirements*
  - *Stakeholders, including analysis of impact and influence*
  - *Communications, including strategies that promote community involvement and transparency and tailor to diverse stakeholders and projects*
- *Monitoring, controlling, and reporting strategies and checkpoints for contingencies and course corrections, if necessary*
- *Approach to sustaining projects beyond the lifecycle of the Challenge, if appropriate*
- *Other details, as required*

Evaluation criteria

- *Plan is detailed, complete, feasible, and well-suited to achievement of outcomes*
- *Plan supports the implementation of projects*
- *Risk strategy is thorough and adequately addresses key risks*

Chapter 3 – Project management

Introduction

A Project Management Plan (PMP) is used to manage the implementation of a project through the formal documentation of any actions necessary to define, prepare, integrate and coordinate the various project activities. The PMP defines how the project will be executed, monitored, controlled, and closed. Project Management is an iterative process and as such, the PMP acts as a living document, which is progressively elaborated upon throughout the course of a project. As part of the finalist stage, our project team has developed a Project Management Plan (PMP) for the implementation phase of the project that includes the following:

1. Project scope, scheduling, sequencing, and dependencies
2. Resource assessment, including human, material, and financial (e.g. workforce capacity, infrastructure readiness, and related initiatives already underway) that are sufficient and appropriate to the achievement of outcomes
3. Strategies for: Risk identification and appropriate mitigation
    a. Procurement, including alignment with technology and partnership requirements
    b. Stakeholders, including analysis of impact and influence
    c. Communications, including strategies that promote community involvement and transparency and tailor to diverse stakeholders and projects
4. Monitoring, controlling, and reporting strategies and checkpoints for contingencies and course corrections, if necessary
5. Approach to sustaining projects beyond the lifecycle of the Challenge.

The following chapter summarizes our team's Project Management Plan, with reference to the appropriate chapter of the proposal that will provide supplementary information. When proceeding with the project, the information contained within this proposal will be restructured to serve as the various project management materials needed to guide the project team through the implementation of the project and beyond.

Project Scope, Scheduling, Sequencing and Dependencies

The scope of our project includes the development of 2,000 hours of Nishnaabe-language immersion videos, the content of which will be our core aadsookaanan (our sacred stories, our philosophical foundations, the building blocks of our Nishnaabe worldview). It is intended that this will create understanders of our Nishnaabe language who can then go on to successfully complete an additional 1,000 hours of STEM educational video, the audio of which is delivered in our Nishnaabe language. It is worth reiterating that the model being developed can be used for any other language or culture, the idea is to blend STEM education with tradition, to create leaders of tomorrow with a strong connection to their traditions and cultures. For example, the WaaWaa videos can be overdubbed in any language and be just as useful. It is our belief that this is truly a Canadian approach to developing Smart Cities.

This project will move Nishnaabe people from being mainly passive consumers of technology to being active, effective STEM-educated administrators, managers, and users of data who are able to achieve meaningful outcomes for themselves, their community, and other communities. Upon completing high school, our youth will have received more than 2,000 hours of mobile-enabled, online Nishnaabe-language immersion instruction in all of our core aadsookaanan (our sacred stories, our philosophical foundations, the building blocks of our Nishnaabe worldview).

Additionally, our youth will be nearly-completely able to comprehend spoken Nishnaabemwin, will have attained a basic proficiency in coding and robotics, and will possess a strong foundation in mathematics and science. All STEM subject videos and courses will be available under a creative commons license, in both Nishnaabemwin and in English. All of this education will occur in a blended-learning environment with a strong real-world participation component built into the program. The eLearning functionality of our community's open source, mobile-enabled, Learning Management System (LMS), Open edX, facilitates the learning of the STEM subjects. And, the eAcquisition functionality of Open edX facilitates the acquisition of our Nishnaabe language. The entire educational experience is tied together with the meetup forum functionality of Open edX serving as a bridge between the digital, online world and the material, real world. Our youth are strongly encouraged and empowered to participate not only in online communities, but in the traditional Nishnaabe activities going on in the real-world community thereby bridging the gap between the online and real world. Based on this

scope of work, the following project management plan has been developed to guide the project team through the implementation phase and beyond. This planning template can also be utilized by other communities when adopting our onboarding approach to a smart city.

It should be noted that this PMP is based on our approach to develop a smart city through the integrated delivery of our culture, language and STEM education; however, other communities that choose to replicate this approach will be able to tailor their project to reflect their culture and language. The products and outcomes of our project, including templates, videos, and curriculum will be made readily available in an open source and transparent format, to be accessed by any community wishing to replicate our approach to developing a smart city.

Project Objectives:

As previously mentioned, our project seeks to achieve the four (4) objectives or outcomes, listed in our Challenge Statement. These objectives are summarized below but are presented in more detail in Chapter One (1), Vision.

Objectives and Measurable Outcomes:

Objectives		Progress Indicator/Measurable Outcome
1.	Youth who are "better-educated"	• Increase in number of K-12 STEM courses successfully completed by K-12 students, • Decrease in percentage of K-12 students needing remedial help in STEM subject areas
2.	Youth who are "more-employable"	• Increase in number of K-12 STEM courses successfully completed by K-12 students, • Increase in number of K-12 students who have at least a basic ability to code
3.	Youth who are "better-grounded" in their Nishnaabe identity	• Increase in number of K-12 students who know the key concepts expressed in each of our core aadsookaanan • Increased annual participation rate in number of traditional Nishnaabe activities for K-12 Students
4.	Youth who are "more holistically Nishnaabe"	• Minimum 2,000 hours of Nishnaabe language acquired by graduating eighth-graders • Increased annual participation rate in number of traditional Nishnaabe activities for K-12 Students • Minimum 1,000 hours of Nishnaabe-language STEM video successfully completed by graduating high school seniors

Scheduling, Sequencing and Dependencies:

To ensure smooth project delivery, project management tools must be implemented. These tools allow the Project Team to understand each task at hand and the relationship, or interdependencies, that they share in reaching project completion. Dependencies show relationships between successive tasks and outline what tasks must be completed prior to beginning another. Using dependencies enables the Project Team to establish a critical path for the project; highlighting key events that must be met to drive the project to completion. This critical path will be depicted visually in the form of a Gantt chart.

Often dependencies result from working with different internal and external stakeholders and, as a result, it is important to establish dependencies before project commencement. As dependencies increase the risk associated with project roll-out, a number of tools and techniques can be initiated to mitigate the effects that they may have.

As a starting point, internal and external dependencies have been considered to determine associated levels of risk. Please refer to subsequent sections

and chapters for descriptions of associated risks. Likewise, the project implementation plans for all project components, presented in Appendix A & B, also show dependencies between activities. The Project Team have been, and will continue to be, assigned to specific tasks and respective dependencies. As the project moves forward, it is likely that further dependencies and subtasks will take form. To ensure the timeline is not affected by these changes, Bi-Monthly Project Team meetings will take place to proactively coordinate around these obstacles and re-establish the critical path. These meetings will be identified in the project schedule.

Project Components:

There are four main parts of this project, all to be hosted on the Open edX learning management system:

1. eLearning, K-12 curriculum augmentations
2. Meetup forum real-world connections
3. eAcquisition, 2,000 hours of immersion video
4. Bilingual STEM video – 1,000 hours of STEM course video

1. eLearning, K-12 curriculum augmentations

With respect to the augmentations to the existing curriculum, the project team has developed a detailed implementation plan to complete the following:

1. Implement code.org curriculum in grades K-5
2. Implement python curriculum in grade 6
3. Implement Robotics curriculum in grades 7 and 8
4. Implement CompTIA A+ curriculum in grades 9-12

The project team will rely on existing and proven curriculum for the implementation of the K-12 augmentations. Teachers will be required to incorporate these curriculum augmentations as part of their existing lesson planning process. All curriculum will be implemented via blended learning and growth mindset approaches.

In terms of the implementation schedule, the selected curriculum of code.org (for example), was selected as it provided “ramp up capabilities” meaning that

kids being introduced to this curriculum for the first time in grade 5 will be able to complete “ramp up lessons” given that they did not have exposure to the K-4 curriculum. Similar, the 5-year implementation schedule for all other grades and curriculums will follow as similar approach, where necessary.

Please refer to Appendix B for additional information regarding our project implementation process, timelines and outputs for eLearning, K-12 curriculum augmentations project components.

2. Meetup forum real-world connections

The Meetup forum functionality of the Open edX platform will enable students and community members to not only connect with the digital community, but also the real-world community, as well as the land and traditional activities. This mobile-enabled meetup forum functionality, provided by Open edX, will serve as the central ‘online gathering’ place which will facilitate the bridging and interfacing of the digital world with the material, real world. All community members will have access to each other via this online gathering place. This functionality is provided directly within Open edX and will provide our youth the opportunity to express their desire to attend a particular traditional Nishnaabe activity. Likewise, community members who are planning an activity will be able to express their intentions in the meetup forum functionality of Open edX, thereby providing additional options for our youth to take part in while remaining in the embrace of the real-world community network. As this is a function of the Open edX Platform, implementation will be relatively simple, requiring the development and provision of instructions to participants and encouraging participation, as part of our overall implementation strategy.

3. eAcquisition and 4. Bilingual STEM course video

With respect to the eAcquisition immersion video and STEM course videos, the project team has developed a detailed Implementation Plan to complete the following:

- Reconstruct and write our core aadsookaanan
- Produce Waawaa video (2,000 hrs)
- Overdub Waawaa video and/or produce Nishnaabe-language immersion video (live-action or 2D-animated)
- Produce bilingual (Nishnaabe-language and English-language) STEM video (1,000 hours)

Please refer to Appendix A for additional information regarding our project implementation process, timelines and outputs for the eAcquisition and Bilingual STEM Course Video project components.

To summarize, the approach taken in terms of the production of the Waawaa video and Nishnaabe-language immersion video and bilingual STEM videos has been to intentionally ramp up production over the course of the 5-year project implementation. The reason for this is to allow for review and critique of the first round of videos to allow the project team to adjust course and make any improvements, as deemed necessary. Likewise, it is anticipated that the production of Waawaa videos will become more effective over the course of the project implementation plan, and therefore our team will be able to increase output over the duration of the project.

Based on our pilot studies we have identified that the level of effort to produce one hour of Waawaa video (not including overdubbing) can vary significantly. We have developed our scheduling and implementation plan with sufficient buffer and a ramp up timelines to mitigate this scheduling risks.

Implementation Plans – Strategy

These implementation plans have been developed through reliance on the Project Sponsor and Subject Matter Experts. Project Participants shall follow the implementation plan and schedule. The efficacy of the implementation strategy will be reviewed at each Bi-annual Advisory Team meeting. Should significant issues be encountered during implementation, the project participants shall notify the project manager who can call an ad-hoc advisory team meeting to review the plan and make any necessary course corrections.

Gantt Chart

A detailed Gantt Chart outlining each stage of the project, and all project participants and stakeholders, will be revisited and updated throughout the project lifecycle to ensure smooth transitions between project phases. A Gantt Chart is a PM tool that can be used to summarize critical stages of the project, dependencies and anticipated duration of tasks, as well as providing an effective resource for tracking progress throughout the project lifecycle. Gantt

Charts show the progression and duration of tasks while also showing dependencies of different events within the project. This schedule will be reviewed with the Project Team before project commencement and regularly reviewed and revised as necessary to avoid schedule slippage, reduce redundancy in effort, and expedite successful project delivery.

Resource Assessment

As part of the Project Management Plan, it is necessary to assess the availability and capacity of resources to ensure they are sufficient to achieve outcomes of the project. Biigtigong Nishnaabeg has been developing our internal resources over several years, which has enabled us to be in a position where we can achieve the goals and outcomes of this proposed project. The resources identified as required to complete this project include:

- Human resources with expertise in areas of language, technology, culture (elders), finances, education
- Technological/material resources
- Capacity building and related initiatives
- Financial resources

Human Resources

Human resource management is key when implementing a project as this dictates the connection between the available workforce and the ability of a project's strategies, objectives and goals to be achieved. The best practice for human resource management can be understood through the following six steps;

1. Develop and Revisit project objectives
2. Assess existing capabilities and capacities
3. Estimate future HR requirements
4. Determine job and resource requirement
5. Implement a Human Resource Management Plan
6. Evaluation and corrective action

This non-linear process will be implemented by our team in completing the project and each phase can be revisited as needed, and at minimum at our Bi-

Annual meetings.

The Human Resource Management Plan will be used to provide guidance on how team members will be defined, staffed, managed, and eventually released throughout the project lifecycle. Each member of the team will be assessed based on the following:

- **Role** – function assumed by person on project.
- **Authority** – right to apply resources, make decisions, sign approvals, etc.
- **Responsibility** – duties of work on project team
- **Competency** – skill and capability required to complete assigned activities.

One tool that will be developed is a Responsibility Assignment Matrix (RAM). This method of project management assigns specific actions to each member of the team. Organizing the responsibilities of the team members in a RAM will allow for more organization and can be used to identify a gap in the project team's ability to complete tasks.

Project Roles and Responsibilities

We have secured the necessary human resources for the successful development and implementation of this project. Biigtigong Nishnaabeg has a strong talent pool and exceptional human resources committed to this project. Broadly this includes

- Community leadership (Chief and council)
- Subject Matter experts
  - (in areas of language, culture and STEM)
- Technical staff
- Administrative support (finalizing)

Current key human resources are identified in the table below:

Role	Participant(s)	Responsibilities
Project Sponsor	Chief & Council	• Represent community • Provide project oversight and guidance • Review/approve some project elements
Subject Matter Experts	• Language consultant • Elders • Industry Partners • Teachers	• Provide language expertise • Provide cultural expertise • Provide Curriculum Expertise
Advisory Committee	Community and Industry Leaders	• Approves major funding and resource allocation strategies • Authorizes significant changes • Resolves conflicts and issues • Provides clear direction to the Project Manager • Review project deliverables and milestones • Identify risks and mitigation strategies
Project Manager	Band Administration	• Manages project in accordance to the project plan • Coordination with Advisory Committee • Supervises consultants and SMEs • Provide overall project direction • Direct/lead team members toward project objectives • Handles problem resolution • Manages the project budget
Project Participants, incl. technical staff and admin support	• Elders • Teachers • Language consultant • Video production team • Others to be identified by SC project Advisory committee	• Communicate project goals, status and progress throughout the project to other participants, and project manager. • Review and approve project deliverables and accountable for milestones • Creates or helps create work products (videos, written materials, curriculum). • Coordinates participation of individuals, teams and stakeholders • Provide knowledge and recommendations • Evaluate outcomes and provide input on key performance indicators • Helps identify and mitigate project risks • Assure quality of products that will meet the project goals and objectives • Achieve milestones on time and on schedule

Other roles and responsibilities are described in relevant sections of this proposal, including Chapter 5 which provides the roles and responsibilities of the governance structure for Biigtigong Nishnaabeg First Nation.

Infrastructure/Material Resources:

The infrastructure required for this initiative includes the eLearning, eAcquisition, and meetup forum functionalities of the Open edX platform. This online platform will be the primary method of delivering language and STEM training to the target audience. Other technologies/software include Code.org, Tynker.com, Lego.com, CompTIA A+ Exam preparation materials and curriculum, etc. Additional information related to technology resources are included in Chapter 4 of this proposal and will be available to the project team

as part of the Project Management Plan.

Capacity Building and Related Initiatives

As part of the Project Management Plan, it is important for the project team to have a solid understanding of existing and ongoing initiatives that may influence the Smart Cities project. The project team has identified three (3) existing projects of particular importance to this project, and that should be monitored as part of the project management process. Project leads from each of the below initiatives are already identified as key stakeholders as part of the Smart Cities process and therefore will continue to be consulted over the course of the project implementation, and beyond, as outlined in our engagement plan presented in Chapter 6.

- **Language Project**: ongoing project to capture and preserve the Nishnaabe language and more specifically the Biigtigong dialect.
- **Curriculum Development**: ongoing project to emphasize cultural and land-based learning activities for K-8 students.
- **New School Project**: The community has identified continued education, job readiness and skills training and development as a high priority. Biigtigong Nishnaabeg is currently in the process of designing a new elementary school and Business Training and Education Complex. These facilities can be used to promote this program and facilitate participation by youth and young professionals. By having this easy access to the target audience this will ensure that the program is adopted.

Financial Resources

This project will rely on the financial resources provided by the community, other participants and Infrastructure Canada, as presented in Chapter 8.

Strategies for: Risk identification and appropriate mitigation

With any given project there is the potential of risk throughout its lifespan. Risks can be any influence which affects the success of a project (i.e. in terms of budget or schedule). Therefore, risk management is an essential process of identifying, analyzing and responding to these influences that may occur, to

ensure the project stays on track. Specifically, risk management involves identifying categorizing, prioritizing and planning for risks, with risks being identified as anything that could potentially impact the success of the project (deadlines, quality, or budget etc.). Throughout this project, risk management will be approached as an iterative and proactive process.

The project team will revisit the Risk Management Strategy throughout the course of the project as needed to identify and monitor the potential risks during each phase of the project. Once a Risk Management Strategy has been finalized, deviation from the agreed upon schedule/budget/scope of work will be identified and promptly communicated amongst the project team so that corrective actions can be taken in a timely manner. It is the intent there will be regular project meetings held to monitor the progress made and to identify any potential risks.

The initial Risk Assessment has resulted in the identification of initial project risks, and these are presented throughout our proposal. Key Risks and mitigation strategies are summarized in the table below (Additional risks are identified throughout our proposal):

Risk	Likelihood	Impact	Risk Management Approach/Mitigating Actions
Low Student Participation	Medium	Medium	• Program is designed to be interactive and hands on approach • Meaningful outcomes • Onboarding and recruiting strategies • Incentives – i.e. Summer Student Employment • Community celebrations • Good co-op placements • Offer program neighboring First Nation • Develop on-line resources for scalable and replicable
Technology, software and curriculum becomes outdated	Low-High	Medium	• Over time (long-term) the chosen technology and curriculum may become outdated. Responsibility of project team (including SMEs) to continuously identify alternatives. • Designed curriculum based on building blocks, so that the principles of STEM curriculum will not change, • Teachers to continue to revisit teaching lessons and curriculum through existing processes.
Nishnaabemwin audio overdub cost is too high	Medium	High	• Audio-video editing software & related training • Establish work flow procedures and accountabilities • Set up a review & monitoring system • Establish best-practices • Consider use of a first-speaker as a consultant • Research animation and other technological options • Focus priorities and on core competencies
Extreme high cost of uploading and downloading video	High	High	• ISP (PRDC) is providing free on-site services to assist in the offloading, downloading and uploading of video
Expensive video backup system; cloud service unreliable for now	Medium	High	• Develop safe and reasonably costed manual backup system • ISP (PRDC) is setting up a free back up system on their servers
Loss of $100,000 financial contribution from Chief & Council	Low	Medium	• Examine projects and make adjustments (cuts) where necessary • Ensure efficiency and effectiveness of projects • Provide and show value for the $100,000 donation – produce results • Apply for other funding and financial contributions
Change in partners/3rd party involvement or withdrawal.	Low	High	• Build Relationships • Formal agreements • Identify alternative strategies • Continually monitor risk
Admission of new partners.	High	Medium	• Admission mechanisms • Needs based; team approval process • References – due diligence
Conflict of Interest	Low	Medium	• Build strong communication • Maximum transparency • Implement Conflict of Interest Policy
Potential inequalities in partners' resources and	Medium	Medium	• Focus on consensus-based decision making • Address in formal agreements

The goal of our risk assessment process is to identify, characterize, prioritize and document a mitigation approach relative to those risks which can be identified prior to the start of the project. The Risk Assessment will be continuously monitored and updated throughout the life of the project and will be communicated with appropriate stakeholder as per our engagement plan, presented in Chapter 6.

Since mitigation approaches must be agreed upon by project leadership (based on the assessed impact of the risk, the project's ability to accept the risk, and the feasibility of mitigating the risk), it is necessary to allocate time during each Advisory Team meeting, dedicated to identifying new risks and discussing mitigation strategies.

Procurement, including alignment with technology and partnership requirements

Our procurement strategy will follow our internal policies and procedures which mandate minimum requirements for service delivery, contract terms, First Nation involvement, etc. For this project the majority of procurement requirements have been established through development of this proposal and are the approach is relatively uncomplex in that they are with preestablished service and software providers, products and partners.

Stakeholder identification, including analysis of impact and influence

A stakeholder refers to any individual, organization or group of people with an interest in the project or the ability to affect its outcome. All stakeholders therefore have a vested interest in the successful outcome of a project. From previous engagement experiences on other projects, we understand the importance of including the diverse groups that will be impacted and/or could impact the project. We understand that this journey, especially the reclamation of our language and aadsookaanan, will potentially stir emotions resulting from historical impacts from cultural genocide. We further understand, that it is necessary to walk through these hurts together in order to move forward, heal and reclaim our culture and identity. This proposal required the input of

everyone, as it provided another opportunity to build stronger individuals, families, community and a Nation.

In identifying our stakeholders, we considered those who would be immediately impacted and those impacted according to our 7th generation principle (See Chapter 5). Various target groups have been identified and strategies established to facilitate meaningful engagement. As we move forward from development to implementation, we remain committed to developing effective engagement processes that build upon best-practices while creating new and innovative ways of engagement with the project stakeholders. Furthermore, expectation, assumptions and potential risks for each stakeholder will be identified through this engagement. Having an understanding of what is considered the most important outcome for the project amongst the different stakeholders allows project managers to tailor their approach to align with and meet stakeholders needs. Please refer to Chapters 5 and 6 of the proposal for additional details on our stakeholder management process.

Communication Strategies

Having the support and involvement of all stakeholders will add value to the project, not only through meaningful participation but to also allow for open dialogue and feedback throughout the project. The community engagement strategies completed to date for this project have focused on using our cultural practices to empower youth and community members in a meaningful way.

Throughout the implementation stages of this project a number of these strategies, including community meetings, reporting, surveys, working groups and traditional ceremonies, will be utilized to ensure the continued involvement of the stakeholders at each stage of the project. Most importantly, knowledge sharing and discussions with community members, particularly elders, will be integral to better understanding our traditional Nishnaabe language.

Engagement events (i.e. working groups, community meetings) will be advertised to community members and the general public through the appropriate channels, including but not limited to social media, newsletters and event bulletin boards. A full Engagement Plan for the project can be found

in Chapter 6.

Monitoring, controlling, and reporting strategies

Monitor and Control Project Work is the process of tracking, reviewing, and reporting the progress to meet the performance objectives defined in the Project Management Plan. The key benefit of this process is that it allows stakeholders to understand the current state of the project, work completed, budget, schedule, and scope forecasts.

Each member of the project team will be responsible for monitoring the schedule and tasks completed under their supervision. Thus, information sharing and regular communication amongst the project team will be a key component for success.

Should the project team be unable to complete tasks in the allotted timeframe, corrective measures will be implemented immediately, to ensure the project continues without significant delay. Corrective actions may include more frequent project update meetings/conference calls which will allow the project team to collaboratively adjust the internal schedule of the project to ensure all tasks can be completed.

Bi-annual and annual reporting will be conducted and presented to stakeholders throughout the duration of this project, as per the communication and engagement strategy. Bi-Annual reports will coincide with the financial reporting aspect discussed further in Chapter 8.

In terms of reporting to be received from Teachers, reporting to the project team will be completed in the form of summarized and anonymized data, following an agree to template. Reporting to parents and students will follow the exiting process governing their current reporting practices (i.e. report cards).

Approach to sustaining projects beyond the lifecycle of the Challenge

Our project is designed to be implemented over the course of 5 years, with official project initiation beginning September 2019 and implementation ending in August 2024. That being said, significant resources are already in place, and much effort has been expended in developing this proposal, which will allow us to hit the ground running. Notably, this project does not have an “end” to its lifecycle, instead the project intends to implement the curriculum which can then continue indefinitely. Of course, there will be the need to continuously review, adjust and enhance the approach and curriculum content, especially in terms of STEM education, but the entire idea of this project is to provide long lasting change to our community which can then be replicated and implemented by any community across Canada or the world.

As previously mentioned, our approach to creating a smart city is an onboarding strategy that would provide long lasting effective change to communities, through empowering youth (and others), through cross-generational transfer of cultural knowledge as well as the much-needed STEM knowledge required to ensure active participation in a smart technology driven economy.

Chapter 4 – Technology

Winners will likely have many projects with a technology component, as the use of connected technology is a core element of a smart cities approach. This chapter outlines the details needed to ensure the alignment of the approach to the achievement of outcomes, feasibility, interoperability, replicability, and scalability of these types of projects. On a related note, while undertaking projects that employ open technology solutions (i.e. non-proprietary, multi-vendor, open architecture) is advisable in order to facilitate replicability, there may be cases where they generate intellectual property. This chapter should demonstrate your commitment to pursuing options that allow you and other communities across Canada to benefit from your smart cities approach to the greatest extent possible.

Provide a technology plan for the implementation phase, including:

- *Details about the technologies, including relevant applications elsewhere and results of testing and/or piloting in finalist phase*
- *Approach to future-proofing the technologies (i.e. safeguards against vendor-generated proprietary constraints and obsolescence, workforce that is able to implement and operate the technologies and systems going forward)*
- *How the technologies comply with relevant legislative and regulatory requirements*
- *Adoption or development of standards, architectures, certifications, initiatives, and guidelines, including how these will enable:*
  - *interoperability between the technologies, other technologies, existing community systems and services, and infrastructure*
  - *replicability and scalability*
- *Roles and responsibilities of technology partners*
- *Accessibility and usability of the technologies to diverse users, residents, and other stakeholders that support their uptake and acceptance*
- *Identification of risks (e.g. privacy issues, cybersecurity breaches) and development of appropriate mitigation strategies*
- *Other details, as required*

Evaluation criteria

- *Plan is detailed, complete, feasible, and well-suited to achievement of outcomes*

- *Plan supports the implementation of projects*
- *Risk strategy is thorough and adequately addresses key risks*

Chapter 4 – Technology

Introduction

Technology in Biigtigong's on-reserve elementary school and on-reserve high school will help revitalize language and culture, will enhance student learning, will provide students with modern bilingual STEM education, will strengthen students' real-world connections to our Biigtigong territory and to other community members, will improve the efficiency and productivity of teaching staff, and will facilitate communication among students, teaching staff, parents, and elders.

The Vision for Technology

Technology is being utilized firstly as a foundation of our entire proposal – the delivery of the Learning Management System – namely Open edX. Open edX, in turn, then serves as the platform atop which our K-8 students will be acquiring their Nishnaabe language – via 2,000 of immersion video instruction, the content of which is our aadsookaanan (our sacred stories, our philosophical foundations, the basic building blocks of our Nishnaabe worldview). Our aadsookaanan will be reconstructed and written, over the five-year period of this proposal – the aadsookaanan reconstruction process assisted, as well, by technology. Additionally, our students in both elementary school and high school will also have STEM education delivered to them on the Open edX platform in a blended-learning environment (i.e., brick-and-mortar instruction augmented with an online component), by augmenting our current K-12 curriculum with the following:

- For our grades K-5 students, the Computer Science Fundamentals curriculum of Code.org.
- For our grade 6 students, a coding course using the Python programming language.

- For our grades 7 and 8 students, two courses in LEGO Robotics utilizing an expanded, projects-based version of the LEGO MINDSTORMS EV3 Curriculum.
- And, for our high school students, the full curriculum of the CompTIA A+ information technology exam preparation.

Additionally, for our high school students, they will receive, through the medium of our Nishnaabe language, STEM course instruction via 1,000 hours of STEM course videos (available in both the Nishnaabe-language and the English-language.) Professional development will be provided throughout the five-year period for all staff to ensure that culture-based technology is used to transform learning and language acquisition opportunities for all students.

Community informationals will be delivered throughout the five-year period for all community members – especially parents of students – to maintain their informed technology-related decision making.

Plan Duration

The duration of the Plan will be five years (September 2019 through August 2024). The Plan will be reviewed and updated bi-annually. The focus of this technology plan is the curriculum augmentations, community informational, and professional development components.

Stakeholders

The stakeholders to this technology plan include the whole community – including students, teachers, administrators, parents, information technology staff, and elected leaders.

K-12 Curriculum Augmentation

We are building a modern bilingual K-12 STEM curriculum by augmenting our current K-12 curriculum. This chapter will focus on those planned-for K-12 curriculum augmentations.

Technology Plan Vision and K-12 Curriculum Augmentation Rollout by Year

Vision for Technology and K-12 Augmentation

Our vision for technology is the curriculum represented graphically in Chapter 1's Figure 1-1, delivered via the Open edX platform.

Rollout by Year

The yearly rollouts below support the Vision for Technology and K-12 Augmentation. These rollouts begin with an exit goal that states what we expect twelfth grade students graduating from our school to know and be able to do and is followed by yearly rollouts of technology Types 1 and 2 for students and staff who will support learning in our classes and our overall instructional program. These rollouts are intended to guide the implementation of technology across our K-12 curriculum, professional development of teaching staff, educate the community on the relevant technologies, deliver bilingual K-12 STEM knowledge, and support the reconstruction and revitalization of our Nishnaabe language and aadsookaanan (sacred stories).

Exit Goal: Students graduating from Biigtigong's high school (whom have also graduated from Biigtigong's elementary school) will be able to code in an introductory text-based programming language (Python), will be able to assemble and control robots using a text-based programming language (ROBOTC, a language similar in structure to the C programming language), will have successfully completed the exam preparation curriculum for both parts of the CompTIA A+ exam (exam #220-1001, and exam #220-1002), will be able to nearly-completely understand their Nishnaabe language, and will know all of their core aadsookaanan.

Yearly Rollouts of Type 1 Technology:

Year 1 (Sep. 2019 – Aug. 2020)

- We begin using Appsembler, our chosen SaaS-provider of the Open edX platform, to deliver our augmented K-12 curriculum.

Years 2 through 5 (Sep. 2020 – Aug. 2024)

- We continue using Appsembler, our chosen SaaS-provider of the Open edX platform, to deliver our augmented K-12 curriculum.

Yearly Rollouts of Type 2 Technologies:

Type 2: Technologies utilized in our K-12 curriculum
For the rollout schedules of the technologies utilized in our K-12 curriculum, please see Appendix B and Appendix C for each of the five years of this proposal.

Detailed curriculum documents can be found here:

- Code.org – Computer Science Fundamentals curriculum:

  https://code.org/curriculum/docs/csf/CSF_Curriculum_Guide_2018_smaller.pdf

- Python 1 – Tynker.com's 'Python 101' course curriculum:

  https://www.tynker.com/school/coding-curriculum/scope-sequence

- Robotics 1 and 2 curriculum – LEGO MINDSTORMS EV3 curriculum:

  https://education.lego.com/en-us/downloads/mindstorms-ev3/curriculum

- CompTIA A+ exam preparation curriculum:
  - Exam #220-1001: https://www.certblaster.com/wp-content/uploads/2018/07/A-plus-220-1001-pdf-Exam-Objectives.pdf
  - Exam #220-1002: https://www.certblaster.com/wp-content/uploads/2018/07/A-plus-220-1002-pdf-Exam-Objectives-1.pdf

Type 2: Technologies utilized in the reconstruction and writing of our core aadsookaanan
In the interest of effective use of space here in this proposal, these technologies will be utilized on an as-needed basis to write our

aadsookaanan. These technologies will be utilized throughout all five years of the five-year period.

Type 2: Technologies utilized in the production and provision of our three types of video
In the interest of effective use of space here in this proposal, these technologies will be utilized on an as-needed basis to record, overdub, animate, and edit our video. These technologies will be utilized throughout all five years of the the five-year period.

Yearly Rollouts of Professional Development and Community Education:

Year 1 (Sep. 2019 – Aug. 2020)

- We begin delivering technology-related professional development to K-12 staff.
- We begin delivering technology-related informationals to community members – especially to parents of students.

Years 2 through 5 (Sep. 2020 – Aug. 2024)

- We continue delivering technology-related professional development to K-12 staff.
- We begin delivering technology-related informationals to community members – especially to parents of students.

Details about the Technologies

In addition to our existing technology, there are two main types of technology needed to implement our proposal. The first type comprises the constituent technologies of our Learning Management System (LMS), Open edX. Broadly speaking, Open edX is *the* technology which houses the entire blended-learning experience which we're planning to deliver with our proposal. The second category comprises all other technologies which enable that experience to occur. This second category includes the technologies utilized in our augmented K-12 curriculum; the technologies used in the reconstruction and the writing of our core aadsookaanan; and the technologies employed in the production and provision of our three types of video: Waawaa immersion video, Nishnaabe-language immersion video, and bilingual (Nishnaabe-

language and English-language) STEM video.

Current Technologies

Current Hardware

- Apple iPads (*Student Usage*): 60
- Apple iPads (*Teacher Usage*): 5
- Apple MacBook Pro laptops (*Student Usage*): 34
- Apple MacBook Pro laptops (*Teacher Usage*): 10
- Windows desktop PCs (*Student Usage*): 22
- Windows desktop PCs (*Teacher Usage*): 4
- Apple iMac desktop computers (*Teacher Usage*): 1
- Promethean ActivBoard Touches: 6
- Digital SLR Cameras: 2
- Digital Cameras/Recording Devices: 2

Current Software

- Video Editing: Windows Movie Maker, iMovie, Adobe Premiere Pro
- Photo Editing: Adobe Photoshop
- Office Productivity
  - For Windows: Word, PowerPoint, Excel, Publisher, OneNote, Outlook
  - For macOS: Pages, Keynote, Numbers, Notes

Type 1 Required Technologies

Technologies utilized to deliver our Learning Management System (LMS)

- Open edX platform (open source – GNU Affero General Public License)
  - Open edX iOS mobile app (open source – Apache License)
  - Open edX Android mobile app (open source – Apache License)
  - Written in Python (open source – Python Software Foundation License (PSFL) [a BSD-style, permissive free software license which is compatible with the GNU General Public License (GPL)].)
  - Built on Django (open source – Django's BSD license)

    - Utilizes PostgreSQL relational database (open source – PostgreSQL License [a liberal Open Source license, similar to the BSD or MIT licenses])
- Khan Academy API (free proprietary)
- Appsembler (proprietary SaaS-provider of Open edX)
- Customizations by Biigtigong Nishnaabeg to Open edX platform (open source – GNU Affero General Public License)

Type 2 Required Technologies

Technologies utilized in our K-12 curriculum

- Code.org (open source – Apache License)
- Khan Academy (free proprietary)
- Python (open source – Python Software Foundation License (PSFL) [a BSD-style, permissive free software license which is compatible with the GNU General Public License (GPL)])
- LEGO MINDSTORMS EV3 Software (free proprietary)
- LEGO MINDSTORMS EV3 Robot Kit (proprietary)

Technologies utilized in the reconstruction and writing of our core aadsookaanan

- LibreOffice desktop office productivity software (open source – Mozilla Public License Version 2.0)
- ONLYOFFICE desktop office productivity software (open source – AGPLv3)
- MariaDB relational database (open source – GNU GPL v2.0)
- HeidiSQL free and open source administration tool for the MariaDB relational database (open source – GNU GPL v2.0)

Technologies utilized in the production and provision of our three types of video

- Storywriting and screenwriting software (Mariner Persona, Write Brothers Dramatica Pro, Movie Magic Screenwriter)
- Storyboard software (Moviestorm Filmmaker, Power Production's Storyboard Artist Studio, Storymind StoryWeaver)
- Office productivity software (LibreOffice, ONLY OFFICE)

- Digital Pen (Epic Pen)
- Drawing Tablet (Wacom drawing tablet)
- Mocap-capable 2D animation software (Adobe Creative Cloud – Character Animator)
- Webcam (to interface with mocap-enabled 2D-animation software)
- Microphone and accessories (for recording audio with which to overdub the video)
- Riggable 2D-character creation (Adobe Creative Cloud – Illustrator, and Photoshop)
- 3D modelling software (for the creation of assets for the animatics in the 2D-space 'digital flip chart' immersion instruction by the 2D-animated character) (Sketchup Pro)
- Screen recording software (TechSmith Camtasia)
- Video-editing software (Adobe Creative Cloud – Premiere Pro)
- Audio-editing software (Adobe Creative Cloud – Audition)
- SFTP (Secure File Transfer Protocol) client (WinSCP)
- SSH (Secure Shell) and Telnet client (PuTTY)
- Video player software (VLC Player)

Relevant Applications Elsewhere

These technologies are applicable and useful in governance (especially for effectively engaging community member in all facets of community life), new council member initiation, training of new staff, ongoing professional development of current staff, general community informationals, and bringing the entire organization online.

Results of Testing and/or Piloting in the Finalist Phase

We achieved fun and excellent results throughout the finalist phase in all of our pilot projects. Our biggest challenge, as we mentioned in Toronto at our November Jury Check-In, was easing the fears of the teachers and inspiring them with hope for new possibilities concerning their lack of technical expertise in the areas of Technology and Engineering. Coding, in particular, seems to have unnerved the staff of our elementary school the most. Our Elementary School's professional development sessions with the teaching staff, their testing and piloting of the technologies in the classroom and the community, including actual blended-learning classroom sessions using Khan Academy and Code.org, building and controlling Lego robots, and employing

block-based programming to control circuit boards using Scratch and Makey Makey, transformed these moments of doubt into empowering moments of possibilities (in our teaching staff's own words!).

Approach to Future-Proofing the Technologies

Firstly, most all of our software applications which are not open source have 'safety-net' open source equivalents. This is how we're safeguarding against vendor-generated proprietary constraints and obsolescence while simultaneously enabling transferability and scalability. Our few proprietary choices here allow us to go faster and thus be more efficient and effective with our time due to the fact that we have personnel with considerable experience in the proprietary versions of these software applications. Should, however, any of the vendors of these proprietary software applications which we're using do something which disallows us to continue effectively using their software, we can quickly and near-frictionlessly switch over to the respective open source equivalent software application with little to no interruption in our workflow.

Secondly, while we are certainly onboarding youth into the smart cities future, we're also onboarding K-12 teachers and staff, as well as community members in general. The continuing professional development of teaching staff, and the ongoing informing of the community will produce for us a workforce that is able to implement and operate the technologies and systems going forward into the smart future.

Adoption of Architectures, Guidelines, and Initiatives

Had we chosen to install Open edX's software on servers other than Appsembler's, we would have indeed had an an architecture adoption challenge to contend with. Because we are attempting to make this proposal's approach to moving into the smart future as newbie-friendly as possible, we have chosen to simply use Appsembler as our SaaS (Software as a Service) provider of the Open edX platform. The architecture issue thus goes away as we have only a web-based interface to Appsembler to contend with. A very newbie-friendly approach, indeed.

The guidelines that concern us here are the blended-learning guidelines. We are not advocating for an ‘online’ school. What we are advocating is enhancing brick-and-mortar curriculum delivery with some online options. The guidelines for attaining this hybrid approach is what we are referring to when we use the term ‘blended-learning.’

Similarly, the initiative which concerns us here is the Growth Mindset as implemented by Khan Academy. The Growth Mindset can be many things to people. For us, we, once again, take a newbie-friendly approach. The Growth Mindset in its minimalist form is not allowing students to progress in their curriculum studies without first mastering the content in their current stage of learning. For example, a student receiving an 85% in a math quiz, for example, is made to redo the quiz until that student receives a perfect score. This is a fundamental approach of Khan Academy, and one which we wish to emulate on our online quizzes using randomized tests with a large database of possible questions for our students. These randomized tests are what we are referring to in our Type 1 Required Technologies section by Customizations by Biigtigong Nishnaabeg to Open edX platform. These are simple JavaScript scripts placed on the front-end webpages of our students’ quiz pages on Open edX that create a Khan Academy-like testing experience, rendering it what we are referring to as a Growth Mindset Approach to learning.

Interoperability

- Open edX with Appsembler’s API (Application Programming Interface) make the platform interoperable with any other technology one could reasonably choose to interface with.
- Using Khan Academy’s API (Application Programming Interface) for Khan Academy courses which we’ll be offering inside of Open edX makes this customized aspect of Open edX interoperable with nearly any other technology.
- Existing community systems and services are currently not networked. Open edX will be the platform with which Biigtigong Nishnaabeg begins to connect these community systems and services.

Replicability and Scalability

Because we have chosen a foundational platform which is fully open source (Open edX), which we're augmenting with curriculum components (e.g., code.org) and learning-facilitation aids (e.g., Khan Academy) which, too, are nearly all open source and free of charge, our proposal – nearly in its entirety – is replicable in any community one might wish to bring it to.

As we've stated earlier, in the cases where we have chosen to use a proprietary technology – for example, LEGO, which does not operate in the open source ecosystem – we have been careful to make sure that there are near-equivalent open source options – in this case, Raspberry Pi, which does operate in the open source ecosystem – for that technology.

Additionally, as we state several times throughout our proposal, we are offering an onboarding approach to communities that may not have access to bleeding-edge technology, nor perhaps to bleeding-edge technology's administering engineers, programmers, or operators. It is our hope that by keeping the technology requirements of our proposal to a minimum, making our approach as replicable and scalable as is reasonably possible, and still delivering a smart technology approach, we can thereby help facilitate the spread, and long-term acceptance and flourishing of, smart cities throughout Canada.

Roles and Responsibilities of Technology Partners

Technology partners:

- Software and hardware partners
  - Roles and responsibilities are clearly delineated and articulated in the software licensing agreements of each of the technologies.
- Pic River Development Corporation (PRDC) – Internet Service Provider (ISP)
  - Most importantly, PRDC's role is to provide for our Waawaa immersion video producers a place in which to offload their video each week. Without this important role being played by this ISP partner, our video producers are forced to use Dropbox or something similar to upload their video instead of being able to simply offload it. This is not an ideal option as piloted upload times during the finalist phase had been

exorbitantly and prohibitively high. Offloading all of their video each week onto the servers at PRDC's office is an extremely time-efficient way to get their video to our Nishnaabe-language overdubber.

Technology Accessibility and Usability for Uptake and Acceptance

Community informationals, especially for students and parents of students, will facilitate the community's uptake of Type 1 and Type 2 technologies.

Identification of Risks

Technology – Risks and Mitigation Strategies			
Risk	Likelihood	Impact	Mitigation Strategy
Limitations as a result of internet connections.	Medium	High	• Selective over software – set standards & assessment • Minimize use of cloud computing
Video uploading and downloading time is lengthy and irregular.	High	High	• Agreement with the ISP (PRDC) • PRDC to provider server space for video storage • PRDC will upload video to their servers
Lose control over data	Medium	High	• Establish local control policy & provider/partnership assessment process • Thorough planning over data collection & data management • Formal agreements for control • Establish monitoring system
Resistance from all levels – students, parents, staff	Medium	Medium	• Conduct education sessions • Professional development • Good communication systems • Regular reporting • Set up support systems • Provide performance summaries
Risks related to the increased access to sensitive information	Medium	High	• Secure computers, servers and wireless networks • Use anti-virus and anti-spyware protection, and firewalls • Regularly update software to the latest versions • Use data backups that include off-site or remote storage • Secure your passwords • Train staff in IT policies and procedures
Cyber-threats including malware	Low	High	• Security software, user training, and policies and procedures in order to safeguard our systems, networks, and information.
Commercial software providers are now integrating their products with social media sites, making risk mitigation very difficult.	Medium	Medium	• Try to avoid providers who integrate their products with social media. • Formal agreements to address issue
Failed Internal Processes – the failure of internal processes to perform as needed or expected. This comes from poor process design or execution, or faulty process controls.	Low	Medium	• Technology development team to develop processes • Stringent review process and reporting • Communication of internal processes • Education
Lack of technical competence	High	Medium	• Recruiting plans • Internal building of capacity – short and long term • Use of experts • Outsourcing
Financial Costs too high	Medium	Medium	• Good planning and cost estimates • Budget reviews • Alternative revenue sources • Internal program reviews – looking for efficiencies

Chapter 5 – Governance

Introduction

Biigtigong Nishnaabeg have always governed ourselves in accordance with our traditional laws, customs, language, traditions, values, processes and structures. Over the years these have changed, mostly as a direct result of the impacts of colonization, where systems in direct contradiction of our cultural ways were imposed upon us. In response to centuries of culture and language loss and disconnection from our social and philosophical systems, we are committed to rebuild our contemporary governance systems that reflect our Nishnaabe culture.

Culture lies at the heart of governance. It forms the foundation and fosters the collectivism of a people through a shared sense of values, beliefs, meaning, knowledge systems, rules, purpose and vision. Through this shared culture, acquired over generations of our people, we are connected beyond the confines of our organization and the projects we create and implement. Our organization and project governance systems are an extension of and reflection of our Nishnaabe way of existing as individuals and as a collective.

The governance plan set out herein seeks to align our Nishnaabe cultural practices and beliefs with modern practices, to facilitate a process that supports the implementation of the project and increases the success of achieving our outcomes. The governance structure has been established under the authority of Chief and Council. The structure was carefully designed to ensure it effectively facilitates the successful implementation of the proposal and the attained of the respective outcomes. It is based on Biigtigong's best practices and in alignment of its long-term vision in respect to governance.

According to the Project Management Institute (PMI), project governance is the elements and strategies that make a project successful. It is based upon the tailored needs of the community. The governance framework and strategies for this project are tailored to the community, rigorous, transparent, and will deliver value for money. The project team will ensure that the

governance framework is implemented throughout the project and adjusted if deemed necessary.

Our Governance Structure

Biigtigong Community:

We are ultimately responsible to the members and residents of Biigtigong Nishnaabeg, including our ancestors and the seven generations to come. The people are the foundation of our governance structures. We are building upon a strong sense of community and a commitment to the vision for our children. Our governance structures and engagement strategies facilitates and builds strong connections with our community. Our Smart Cities Governance Plan makes community involvement and engagement a priority. We will create new opportunities for their involvement and build upon the existing systems. We ensure structures are in place to include our community throughout the lifecycles of projects and our long-term strategies. We are accountable to our members and their involvement is critical to ensuring we achieve our outcomes.

Chief and Council:

As the formal elected leadership of Biigtigong, this governing body is ultimately responsible for the overall affairs of the First Nation. Council has established governance systems that provide the necessary support and parameters for effective project governance systems. Our political and administrative functions are clearly defined and separated. Elected leadership is responsible for strategy and providing the systems, laws, policies, and other resources, to support successful implementation of projects. The governance model adopted for the Smart Cities project follows, aligns and enhances Biigtigong's Governance systems.

The Chief and Council through the authority of Biigtigong's Constitution will establish an Executive Board to oversee the Smart Cities Proposal. Additionally, two committees will be set up to support the proposal and the attainment of the outcomes. Both committees will play an integral role in achieving our outcomes and in creating high levels of accountability and involvement of our community. The following provides a brief overview of

these three entities.

SC Executive Board

This board has been mandated as the governing body to oversee the implementation of our Smart Cities proposal. They will provide strategic direction to ensure the proposal continuously meets the needs of the community and achieves the identified outcomes. The Board will deliberate, make decisions, advise, provide strategic oversight, and to serve as the primary “advocate” for all the Smart Cities initiatives.

The Board is also responsible for the key business issues associated with the project. This includes approving the budgetary strategy, monitoring risks, quality and timelines, making policy, defining outcomes and deliverables, assessing change requests.

The Board will oversee the activities of the Aadsookaanan Reconstruction Committee and the Clan Engagement Committee. Both Committees were established to mitigate potential risks and create new opportunities. The Board will supervise and work the Smart Cities Project Lead throughout the project.

The Board reports directly to the Chief and Council and is subject to the regulations set out in the Terms of Reference for the Board and the Regulations Governing Committees. The Board and Council will collectively innovate on improving the reporting systems, promoting transparency, accountability and stakeholder engagement.

Due to the strategic importance of the proposal to the future of the community, the Chief will sit as the representative of the elected leadership. The Board will also be comprised of our CEO, Education Director and two youth. To increase success and mitigate risks, our Board will also include experts from the following fields: Nishnaabemwin (Language), Science, Technology, Engineering and Mathematics. We have five experts who have committed to sit on this Board.

Aadsookaanan Reconstruction Committee

This Committee will be part of the governance arm and will report directly to the SC Executive Board. Comprised of elders, traditional knowledge holders, and language carriers, youth and parents, this team will be responsible to assist in the reconstruction of our sacred stories, our Aadsookaanan.

Their primary role will be to provide guidance and direction to the technical and research group. They will have decision-making authority to approve the core aadsookaanan and forward the stories to the Immersion Team for video production. The Committee will also assist in mitigating risks that exist or may come to be. The primary risk management strategy includes engaging with the community and providing information and education.

The Committee will operate according to its Terms of Reference and Biigtigong's Regulations Governing Committees. Following our cultural protocols governing elders and the transfer of knowledge is foundational to our governance plan.

Clan Engagement Committee

Engagement with all of our stakeholders is a critical factor to achieving our outcomes. In order to achieve high levels of meaningful engagement, we will employ our traditional clan system for this purpose. Each clan will select 2 representatives to sit on the Clan Engagement Committee. Clan leaders are responsible to report directly back to their respective clans, following the protocols established by the clans. Clan leaders hold the responsibility for two-way communication and reporting. This system allows for diverse engagement and facilitates deeper discussions and collaboration.

Inside the structure of the clan system are protocols that speak to the roles and responsibilities of individuals and the clans. Accountability, disclosure and transparency are inherent to the system. It also addresses ethics, communication, and codes of behavior, decision-making methods and dispute resolution. From an organizational perspective, the Clan Engagement Committee will report directly to and work closely with the SC Executive Board. The team will operate according its Terms of Reference and Biigtigong's Regulations Governing Committees.

Linkages with Existing Committees:

We will utilize existing governance structures to support the implementation of our proposal.

Youth Council

Our governance model will facilitate linkages between the SC Executive Board and our Youth Council, via the Board's two youth representatives. The Youth Council is an existing Committee that represents the interests of the youth and facilitates their involvement in the growth and development of their community. We will utilize this relationship to improve our connections with our youth and ensure we are meeting their needs.

Education Committee

The Education Committee is mandated as an advisory function in support of the Education Department. It is a primary means for parental involvement in education. We will utilize these resources, via the Education Director, to support the proposal's implementation, specifically within the Education Department. This provides another link to the stakeholders and ensures alignment with the Education strategy.

Finance and Audit Committee

The Finance and Audit Committee is responsible to review and make recommendations to Council on the financial administration matters of the Nation. The Finance and Audit Committee assists Council in fulfilling its oversight responsibilities for the financial reporting process, the system of Internal Control, the audit process, and the process for monitoring compliance with laws and regulations and the code of conduct.

The Executive Board will comply with the initiatives of the Finance and Audit Committee and the Director of Finance to ensure financial accountability and transparency. Biigtigong's Financial and Administrative Policies and Procedures govern the financial and human resource management of the project.

Project Implementation Governance Systems

Some of the Smart Cities projects fall under the mandate of existing Departments. These projects shall become the responsibility of various Departments, such as, Education and will be administered in accordance with the existing governance and management systems of the First Nation. There are institutionalized and established systems that define roles and responsibilities, personnel matters, finance, performance management and evaluation, dispute resolution, risk management, reporting responsibilities, lines of authority and lines of command.

Senior Management Team

Inside of this system is an established Senior Management Team comprised of all Department and Service Directors. This body acts as the central coordinating entity for the First Nation that facilitates a holistic approach. A member of this team will be appointed to the SC Executive Board to ensure continuity, alignment and accountability. This individual will also act as a liaison between the Senior Management Team and the Smart Cities Executive Board. Respective Directors will obtain direction and provide input via this process and take the necessary steps for implementation within their departments.

Education Department

Our Education Department will be responsible for the implementation of the core components of our proposal, including the K-12 STEM program, Nishnaabemwin Immersion and the Meet-Up App. An organization review was conducted to determine the requirements for the integration of the new programs. Governance systems that define staffing requirements, organizational and reporting structures, roles and responsibilities, performance management, training and development, risk mitigation strategies, and financial requirements for the Smart Cities implementation are established. The education staff was involved throughout the entire review and development phase.

The implementation of the education components of the proposal will be under the direction and supervision of the Education Director. The Director will report on the activities and status of the projects to the Executive Board and the Project Lead. The reporting structure is designed to be flexible to allow for

adaptive approaches to respond to changing needs. The Education Director will also provide updates and facilitate necessary action and support with the Senior Management Team.

Economic Development Department

This Department will be responsible for the implementation and management of our Youth-owned Student IT Business, the co-op placements and summer employment. Our team will work collectively with this department to create an innovative pathway for our high school students, providing an academic foundation supported by real-world work experiences. Our economic development department will build relationships with STEM based industries to assist in the co-op placements and summer employment. Our co-op program will be governed by the Ontario Ministry of Education standards and our own internal policies. Special considerations for individuals enrolled in the CompTIA A+ program will be built into our Summer Student Employment Policy, to support their path throughout high school.

Smart Cities Inter-departmental Program Committee

As part of our governance structure we will create an inter-departmental program committee, comprised of front line staff that are directly responsible to deliver specific programs. This team will consist of the SC Project Coordinator, Immersion Lead, STEM Lead, Co-op Lead, Meet-up App Lead and the Economic Development Manager. This group will work to strengthen collaboration across the team and integration of projects. They will review activity reports, monitor progress and outcomes, discuss administrative concerns, identify training needs, coordinate project management, identify risks and solutions and create substantial working relationships. The Committee will report to the Education Director. The Education Direction will bring all appropriate matters to the attention of the Senior Management Team and/or Executive Board.

Governance Principles

We will utilize our traditional governance principles, as set out in our Aadsookaanan, as embedded in our language and ceremonies, as practiced within our operations and commit to gaining a greater understanding of our traditional ways and establishing more effective and legitimate governance systems. Our principles support processes that are consensus oriented, participatory and inclusive, transparent, accountable, long-term

considerations, responsive to change, flat and non-hierarchical, and based on relationships. We will adhere to the governance principles identified in Biigtigong's Constitution, laws, policies, procedures, informal protocols and cultural practices.

Decision-making

Our cultural practices utilize a consensus-based decision-making model. As an approach to fostering collaboration, consensus-based decision-making provides every individual equal access and responsibility to the process. This model facilitates improved decisions due to the stakeholders claiming responsibility by providing input in keeping with the best interests of the seven generations to come. It fosters increased interpersonal connections and relationships, resulting in greater sense of cohesion and commitment to the goals and vision. Utilizing our cultural practices and embedding our values inside of our governance system enhances the project and its successful implementation.

Part of our decision-making model includes mechanisms to deal with conflicts and disputes. We utilize a restorative justice model as our dispute resolution process. Based on cultural values our systems aim to restore harmony, balance and build relationships. We will utilize Biigtigong's processes to address potential conflicts with or amongst our stakeholders.

Human Resource Management

Human Resource management is coordinated by Biigtigong's Finance and Administration Department. Policies and procedures are in place to govern hiring and recruiting, training and development, travel, honoraria, salary, compensation, performance appraisals, employee benefits, health and safety, contracts, confidentiality, code of ethics, conflict of interest, dispute resolution, employee relations and well-being. This centralized system promotes fairness, consistency, transparency and accountability. All staffing and awarding of contracts associated with the Smart Cities proposal will be subject to the existing policies of the First Nation.

Change Management

Our culture acknowledges the world is in constant flux and change; we are in a perpetual state of responding to this change. The concepts of renewal and transformation are inherent to how we interact with the inter-connected world.

These beliefs are reflected in our governance systems. We adopt a learning environment that fosters change and utilize iterative management practices to ensure on-going alignment between our outcomes and the needs of our stakeholders. We offer employee assistance programs to assist in change management. Additionally, our Social Services Team provides supports to assist individuals, families and teams, with any issues that arise as a result of change. We also rely on our cultural ceremonial practices to assist in our change management efforts.

Risk Management

Our goal is to create an organization culture where risk identification and management become part of everyday life. Although it is important to conduct a risk assessment at the onset of a project, it is equally important to ensure risk management activities are performed, recorded and monitored throughout the lifecycle of the project. Our risk management strategies aim to accomplish this.

For this project, we will utilize a framework that provides for a process for risk identification, risk analysis, risk response planning, monitoring, controlling and reporting. For each major risk that is to be mitigated or that is accepted, a course of action will be outlined for the event that the risk does materialize in order to minimize its impact. Monitoring and reporting mechanisms will be built into all levels of governance and project implementation. Ultimately, the risk management plan is the responsibility of the Executive Board.

Communication Plan

Communication is the key to a successful project. Our communication plan identifies key stakeholder and avenue for the delivery of pertinent information. Information will be delivered to all stakeholders in a timely fashion. Our engagement plan provides more details on how we plan to build strong communication with our stakeholders.

Control Process

The project team will continuously monitor the project against established timeline and metrics. This will ensure that the project is in accordance will budget and timeline and that deviations are remedied. Our internal systems of control are well defined and tested. We have made some adjustments to

ensure our Smart Cities implementation is done so successfully.

Partnerships

Introduction

The goals of our Smart Cities proposal are ambitious and require a collaborative approach to make them achievable. Partnership opportunities exist across many sectors and include individuals, businesses, education institutions, governments and community organizations. Partnerships are a strategic process and our approach to partnerships begins at home by creating a solid foundation that we can build upon. We want Smart Cities to live beyond the life of the proposal and become part of how Biigtigong exists.

Our Internal Partnerships

The impacts of our proposal outcomes will create substantial change that extends past the individual students and into the social and economic fabric of the community. Preparing our children for the digital world also includes preparing our organizations and community. This is why our membership is best served by aligning our different departments and related organizations. These alliances require deep interpersonal connections and appropriate structures and systems in order to yield the highest benefits.

Our internal partnerships are living systems that evolve progressively in response to the changing environment and the needs of our membership. Building upon and utilizing our internal resources and developing our capacity are necessary to achieve long-term sustainability. Collaboration between our service departments and community owned organizations are critical to achieving success.

Our focus, the central point of everything, is our children and this is what brings us together and keeps us together. The elders always remind us that it is our responsibility to keep our children in the center of everything. Sharing a common vision and purpose is what binds successful partnerships. Our Smart Cities proposal is attached to and supports Biigtigong’s bigger vision of Nation building.

Biigtigong's Service Departments

Our Smart Cities proposal development team, which consisted of two members of the Senior Management Team and the Chief, approached the proposal implementation phase as a collective effort of our entire team. The goals of the proposal align with the overall goals of the organization, making it easy to establish collaboration and project partnerships. We entered into collaboration agreements with our service departments. The purpose of these agreements is to demonstrate that the proposal is supported by the entire organization.

Our internal partnerships are governed by the structures, regulations, practices and historical relationships that exist within the organization. We have established and proven frameworks that we utilize for our projects. These frameworks address general project management requirements, such as, managing risks, finances and resources, quality assurance and performance management, human resource and capacity development, reporting and accountability and team development. Our implementation plan is build upon our assessment of our internal capacities, readiness and resources.

To ensure success, our implementation plan allocates specific tasks to respective departments who have a related mandate. For example, our Sustainable Development Department who is responsible for economic development, employment and training, will be responsible for the establishment of the high school reBOOT IT business, co-op placements and summer employment. While our education department will be responsible for the academic portions of the co-op high school program. Such partnerships allow us to extend the reach of our project goals and build the foundations for long-term sustainability.

The community retains control over sensitive and personal data. We already have established policies and systems that manage and control data collection. We do not want to re-invent systems but rather utilize existing resources and help make necessary improvements where we can.

The initial commitments from our service departments are identified in the collaboration agreements attached. These will be continuously reviewed, monitored and developed to ensure the best possible strategies are

collectively in implemented to better serve our membership. Our Smart Cities proposal has provided another rallying point to collectively strategize in bringing together our efforts to innovate and make meaningful lasting change and improvements.

Our External Partnerships

Two of our main external partnerships are with independent, but related entities of Biigtigong. Pic River Development Corporation is the Internet Service Provider in the community and will provide services for the off-ramping, uploading, downloading and backup storage of our videos at no cost. They also made a financial commitment to support the project implementation. Anishinabek Employment and Training Services is an entity that provides employment support and training services on behalf of 9 First Nations. A three-year financial contribution has been made to assist in the development of the CompTIA A+ and reBOOT co-op education program and the summer student employment portion. Biigtigong has existing agreements with both entities that defines the relationship, mandate, governance structures and other areas. The risks associated with these partnerships are extremely low and mitigation strategies to address the risks are already in place.

Biigtigong has many business partners and professional relationships. Part of our business strategy is to develop mutually beneficial partnerships that create value. We seek to be a ‘partner of choice’ and have a history of successful partnerships. Letters of support from some of our business partners are attached to this proposal. We have not entered into any formal partnership agreements but we will explore the options when needed. At which time we will enter into formal agreements that define the details of the partnership.

Our Service Partnerships

Our Smart Cities team has enlisted the help of two organizations who bring value to achieving our set outcomes. Memorandums of Understanding have been signed with ICTC and reBOOT Canada and provide the details of the partnership. Both entities are assisting us with the implementation of our K-12 STEM programs. Our projects share common visions and provide services that complement each other and provide a good fit. We have developed excellent working relationships and have created a common path and are

equally excited to embark on our journey together.

Anishinabek Education System

23 First Nations are part of an education self-government agreement with Canada and Ontario, forming the Anishinabek Education System. The participating First Nations under the Anishinabek Education System will enact education laws that govern the Anishinabek Education System and the delivery of programs and services. Each participating First Nation has law-making power and authority over education from JK to Grade 12 on reserve. Participating First Nations will also establish and maintain system-wide education standards that support the transfer of Anishinabek students between the Anishinabek Education System schools and the provincial education system schools.

AES is in its development stage and in the process of getting established and operational. The Board has provided a letter of support of our proposal and we will explore options on how our proposal implementation can assist the other 22 First Nations. AES is an opportunity for First Nations to collectively work together to address the education needs of our children. We expect that as AES develops that we will create innovative approaches to improving the lives of our children.

Summary of Partnership Agreements

Source	Type	Notes
Internal Collaborative Partnerships		
Children & Family Learning Centre	Collaborative Service Agreement	Biigtigong Service Department
Health & Social Services	Collaborative Service Agreement	Biigtigong Service Department
Sustainable Development	Collaborative Service Agreement	Biigtigong Service Department
Capital-Housing	Collaborative Service Agreement	Biigtigong Service Department
Finance & Administration	Collaborative Service Agreement	Biigtigong Service Department
Education	Collaborative Service Agreement	Biigtigong Service Department
Service Partnership Agreements		
Pic River Development Corporation	Memorandum of Understanding	Biigtigong Non-Profit Corporation
reBOOT Canada	Memorandum of Understanding	New Partner
Information And Communications Technology Council (ICTC)	Letter of Support Memorandum of Understanding (waiting on approval)	New Partner
Anishinabek Employment and Training Services (serves 9 First Nations)	Letter of Support – financial commitment	Aboriginal Skills Employment and Training Strategy
Industry Support		
S. Burnett & Associates	Letter of Support	Business Relationship/Partner
Anishinabek Education Services (23 First Nations)	Letter of support	Anishinabek Nation Education self-government agreement
Nishnawbe-Aski Development Fund (NADF)	Letter of Support	Business Relationship/Partner
AV Terrace Bay Woodlands	Letter of Support	Business Relationship/Partner
Barrick Hemlo	Letter of Support	Business Relationship/Partner
BDO	Letter of Support	Business Relationship/Partner
CRC Communications	Letter of Support	Business Relationship/Partner
First General Services	Letter of Support	Business Relationship/Partner
Supercom Industries	Letter of Support	Business Relationship/Partner
Chant	Letter of Support	Business Relationship/Partner
Biigtigong Dbenjgan	Letter of Support	Business Relationship/Partner
BMC Contracting	Letter of Support	Business Relationship/Partner
BMO Bank of Montreal	Letter of Support	Business Relationship/Partner
DJB Consulting	Letter of Support	Business Relationship/Partner
FP Innovations	Letter of Support	Business Relationship/Partner
GMS Camps & Catering	Letter of Support	Business Relationship/Partner
Hydro One Networks Inc.	Letter of Support	Business Relationship/Partner
Mkwa Timber GP	Letter of Support	Business Relationship/Partner
Ontario Waterpower Association	Letter of Support	Business Relationship/Partner
Royal Bank of Canada	Letter of Support	Business Relationship/Partner
TBT Engineering	Letter of Support	Business Relationship/Partner
** Evidence and details of partnerships are included in the Appendices.		

Governance and Partnership Risks and Mitigation Strategies

Risk	Likelihood	Impact	Risk Management Approach/Mitigating Actions
Change in partners' involvement or withdrawal.	Low	High	• Build Relationships • Formal agreements • Identify alternative strategies • Continually monitor risk
Admission of new partners.	High	Medium	• Admission mechanisms • Needs based; team approval process • References – due diligence
Conflict of Interest	Low	Medium	• Build strong communication among the partners • Maximum transparency • Implement Conflict of Interest Policy
Potential inequalities in partners' resources and expertise determine their relative influence in the partnership's decision making.	Medium	Medium	• Focus on consensus based decision making • Address in formal agreements • Build relationships • Access to dispute resolution process • Involve experts on Executive Board
Poorly defined shared vision and objectives.	Low	Medium	• Develop shared vision with clearly defined objectives • Link corporate objectives/organizational objectives to the project objectives • Training and Education sessions • Annual reviews
Partners do not meet performance targets in a satisfactory or timely way.	Low	High	• Develop an agreed upon Performance Management framework • Conflict management/resolution procedures • Encourage joint ownership of problems & solutions • Relationship building
Failure to engage key stakeholders in meaningful ways.	Low	Medium	• Awareness & education of engagement strategy • Communication strategy • Performance measurements inclusion • Evaluation strategy
Failure of partner to comply with relevant laws and regulations.	Low	Low	• Identification & education of laws & regulations • Dispute resolution process • Develop safeguards throughout project
Lack of understanding with local culture.	Medium	Medium	• Cultural awareness training • Provide explanations – no assumptions • Dispute resolution
Financial risks No strategic approach to issues of risk, costs and benefits	Medium	Medium	• Define and agree with approach to dealing with costs and benefits of the partnership. • Continuous monitoring & reporting • Utilize Finance Department & Finance Committee
Loss of autonomy	Low	High	• Rigorous selection of partners • Clear agreements
Lack of capacity, skills, knowledge and experience	Medium	High	• External Recruitment Plan • Local training & development plan • Outsourcing and Contracting Options
Poor internal & external communication.	Low	Medium	• Establish communication plan & review • Regular meetings • Structured reports • Use of collaboration tools

Chapter 6 – Engagement

Winners will need to ensure that the primary beneficiaries of their projects—their residents—will continue to benefit from the outcomes and continually confirm that these remain the desired outcomes. Implementing change is difficult, and engaging residents and stakeholders is crucial in obtaining and maintaining their support. Your plans to sustain community engagement throughout implementation, as outlined in your application, should be your starting point. This chapter serves as a demonstration of your commitment to your residents and other stakeholders in maintaining the focus on their true needs and a preview of the engagement activities that they can expect to see during the implementation phase.

Appendix 1 (page 22) provides a detailed guidance on diversity and inclusion.

Provide an engagement plan for the implementation phase, including:

- *Approach to engaging with, gaining acceptance from, and onboarding residents and other stakeholders for projects that ensures ongoing alignment between the outcomes and their concerns and needs*
- *Insights gained through previous engagement processes with residents that shaped the final proposal in a significant way*
- *Tools used in past, planned, and ongoing engagement activities that are adapted to target different population groups and encourage ongoing, high participation*
- *Efforts made to be inclusive and consider the diversity of residents, including the ways in which certain population groups could be positively/negatively and intentionally/unintentionally affected by projects*
- *Experienced or expected reactions from residents and other stakeholders and approaches for managing potential issues*
- *Identification of risks and development of appropriate mitigation strategies*
- *Other details, as required*

Evaluation criteria

- *Engagement to date and plans to engage residents and other stakeholders in the implementation phase are detailed, complete, inclusive, meaningful, and well-suited to achieve the outcomes*
- *Plan supports the implementation of projects*

- *Diversity and inclusion are reflected in project design, and facilitate the implementation of projects*
- *Risk strategy is thorough and adequately addresses key risks*

Chapter 6 – Engagement

Part I: Our Approach to Engagement

Our engagement plan is built upon our fundamental belief as Nishnaabeg that everything is inter-related and inter-connected. We view the world as being in constant motion, made up of complex networks and long-term sustaining relationships. We understand the importance of developing and maintaining relationships and the goal of keeping balance and harmony. As a relationship based system, the principle of inclusion is foundational to how we live our lives. Hence, our approach to engagement is inherently inclusive in nature and facilitates high degrees of community participation in meaningful ways.

Our engagement plan, not only facilitates the involvement of our stakeholders, but it does so in a manner that supports the revitalization of our traditional ways in a modern world. Our engagement plan facilitates the coming together for a common vision and purpose. It supports the continuous development as individuals and as a community, as it affirms our common values, builds trust, strengthens relationships, fosters responsibility and accountability and facilitates community ownership.

Purpose of Engagement:

The overall purpose of engagement is to create opportunities for our children, youth, parents, grandparents, aunts, uncles and all Biigtigong members, to embrace their responsibility for the well being of our community and future generations and become actively involved in creating a better world.

Engagement Objectives:

1. To empower those affected by this proposal to be involved in the decision-making process and the creation of solutions to challenges and opportunities that are specific to stakeholder needs.
2. To ensure the engagement processes are meaningful and seek out real contributions that influence the project design and implementation.
3. To facilitate a learning environment, where the transfer of knowledge and skills encompasses everyone who is impacted by the project.
4. To utilize cultural practices to ensure successful engagement and facilitate community pride.
5. To document and share our experiences with engagement, in order to assist in making this project more scalable and replicable.

Engagement Principles:

The following guiding principles form the basis of our engagement process and approach to ensure high-quality collaboration and meaningful active participation.

1. **7th Generation Principle**: We are responsible for the seven generations to come and to the seven generations that came before us. We will move forward embracing our past and future generations and remember the long-term impacts of our decisions.
2. **All my Relations**: Our way of life is centered on the belief that we are all related and connected. Every decision impacts everything. We will seek out holistic approaches that honour all life and our complex networks.
3. **Relationships**: Developing and maintaining relationships with all life is central to our Nishnaabe way of being, bringing rights, obligations and responsibilities that extend beyond self. We act accordingly, always striving for a state of balance and harmony, as we work collectively towards our vision
4. **Renewal and Transformation**: The notions of renewal and embracing change are inherent in our worldview, as we view the world as in a state of constant flux and change. We will utilize approaches that respond to continuous change and implement on-going evaluation to ensure we are meeting our goals and the needs of the community.
5. **Process Focused**: Comprised of approximately 70% verbs, the importance of process and actions are embedded in our language. Our

approaches will be action-orientated, focusing not only on achieving results, but also on the journey and lessons that our journeys bring.

6. **Natural Laws**: We learn about what our behaviour should be by observing Mother Earth and respecting the natural laws.

Stakeholder Identification

This proposal will change the essence of the social fabric of the community. From previous engagement experiences on other projects, we understand the importance of including the diverse groups that will be impacted and/or could impact the project. We understand that this journey, especially the reclamation of our language and aadsookaanan, will potentially stir emotions resulting from historical impacts from cultural genocide. We further understand, that it is necessary to walk through these hurts together in order to move forward, heal and reclaim our culture and identity. This proposal required the input of everyone, as it provided another opportunity to build stronger individuals, families, community and a Nation.

In identifying our stakeholders, we considered those who would be immediately impacted and those impacted according to our 7th generation principle. Various target groups were identified and strategies established to facilitate meaningful engagement. Evaluations of these approaches were conducted and necessary changes were implemented and/or noted to improve outcomes. As we move forward from development to implementation, we remain committed to developing effective engagement processes that build upon best-practices while creating new and innovative ways of engagement.

Part II: Our Engagement To Date

Efforts to ensure participation amongst the diverse groups within the community have provided valuable insights that have significantly improved the final proposal. Our engagement processes to date have resulted in obtaining a clearer understanding of the challenges and opportunities that exist or could potentially exist throughout the life of the proposal implementation stage and beyond. It facilitated the development of creative mitigation risk strategies and creative means to grab the opportunities. Our engagement process has led to an excitement; it has provided a central

rallying point. The following provides a list of primary stakeholders engaged to date, the methods used for engagement and the insights gained from the engagement that shaped our proposal.

Formal Leadership

Engagement with our elected leadership has reiterated their long-term commitment to the goals and the expected outcomes of this proposal. Council echoed the need to build everything in a manner that will lead to long-term sustainability. In order to ensure long-term success, the spirit of the proposal must become part of the DNA of the entire organization and community. Due to the nature and outcomes of the proposal, the entire organization and community, must strategically align resources in the collective pursuit of our vision.

Council understood the need to build STEM knowledge in order for the community to participate in the rapidly changing world. Additionally, that the creation of children who understand their traditional language, for the first time in centuries, will profoundly change the fabric of the community and our institutions. Council also restated their excitement that our proposal will impact people beyond our community. Direction was provided to our Senior Management Team to ensure our strategies align and support the specific goals and outcomes of the Smart Cities proposal.

Our Senior Management Team is constantly creating, evaluating and reimaging our vision, our strategies, successes and failures, in our efforts to build our Nation. Working towards a common vision, our education, health, social services, lands and resources, governance, economic development, housing, and public works team, collectively and strategically aim to address the needs of our community. Our engagement with Senior Managers allowed us to work towards a common vision and develop mutually supportive and attainable goals.

Language and aadsookaanan reconstruction and revitalization is an organization wide goal and will impact our existing service delivery models. For example, upon the completion of the aadsookaanan reconstruction work, our Social and Health Department, will utilize this work to reconstruct our rites of passage and develop a service model based on the rites of passage. Another example is the re-visioning of our dispute resolution policy and the

alignment with the ancient teachings contained in our aadsookaanan. A review of our Human Resource Strategy will be conducted in light of the availability of immersion video that will create understanders.

As for STEM, our departments will be providing support, in terms of placements, special speakers, student co-op work opportunities, and STEM related summer employment. Our Senior Management Team are committed to creating the necessary supports, as per the findings of our on-going evaluation and project implementation, to ensure successful attainment of our goals.

The primary engagement tool we utilized with leadership was holding face-to-face meetings both collectively and individually. This method was selected in order to facilitate critical thinking and extensive discussion. Leadership was also represented at all of our other stakeholder engagement sessions. On-going engagement with this particular group is of extreme importance to the success and continuation and growth of our Smart Cities proposal.

Continued engagement will occur through the existing structures that will facilitate on-going connections between the proposal implementation team and the leadership. Senior Management will be responsible to engage their respective staff members. Regular meetings will occur throughout the life of the project, in addition to regular reporting and evaluation. The governing team responsible for the Smart Cities project will have a representative from Council and Senior Management appointed to ensure successful implementation and alignment of goals.

Biigtigong Aadsookaanan Group and Elders

Our elders and traditional knowledge holders are considered major stakeholders in this project. Following our cultural protocols, these groups have been involved in the planning and development of our proposal, including our initial application. Our approach to engagement with our elders usually occurred in informal settings, not in a boardroom. We respected their approach in transferring knowledge and providing direction through the use of stories and personal accounts of life experiences. Individuals from this particular group have directly experienced the affects of residential and day school systems. They are able to speak first hand regarding the loss of language, the loss of their stories and methods of transferring cultural

knowledge and the trials this has caused in their lives and those of their family. They are motivated to create opportunities to reconcile the impacts from this part of our history.

Through our engagement processes, these stakeholders provided strong support for the use of technology in the creation of understanders of Nishnaabemwin (our language) and the transfer of traditional knowledge contained in our Aadsookaanan (sacred stories). Many understood the power of technology due to their involvement in our language reconstruction and documentation project. From first hand experience, they saw the data that everyone contributed and the research data, along with technology, successfully aid in reconstructing our language. Most of our elders and knowledge keepers realize that language revitalization in our community is impossible without the use of technology. Additionally, they felt that making our language and stories available on-line, was the best means to reach our youth. With only one proficient speaker left in our community, taking the data available through our language and making this accessible for everyone, forever, and utilizing immersion, on-line, provided hope and reconciliation.

They also asserted the importance of having our youth and our elders/knowledge keepers interact in real- life experiences. Our elders reminded us that our way of life is tied inherently to the land and more to a specific place. In order for us to transform our youth into better-educated, more-employable, better- grounded and more holistically Nishnaabe, we must keep them connected to their territory and the teachings that can only come from intimate relationships with the trees, birds, fish, wind, rain, rocks and every part of existence. They stressed the importance of our land-based curriculum and the need to build their relationships with Mother Earth.

The primary engagement tool used to obtain input from this target group was the use of face-to-face informal meetings. We followed cultural protocols, with the passing of tobacco and observed the traditional methods of knowledge transmission. We smudged, sang, feasted, told stories, laughed, cried, talked, listened, remembered our ancestors, sat in silence, and together made decisions in the best interest of seven generations.

Our elders and traditional knowledge will continue to play an integral part of our Smart Cities proposal implementation. The role our elders play in our world is very explicit as defined by our cultural protocols. We are responsible

to acknowledge their role and facilitate the inter-generational transfer of knowledge, in a culturally appropriate manner. Our proposal sets out formal and informal on-going space for the involvement of our elders and knowledge keepers. Cultural norms dictate that we are accountable to our elders and as just this guarantees that they will be meaningfully involved in this proposal.

Biigtigong Youth

Our youth are the center of this proposal and are the main beneficiaries and reasons for this proposal. Part of our engagement strategy for this group, included the examination of results and other engagement sessions held by other community projects. We utilized this information to augment the information we obtained through our engagement sessions.

Through surveys and personal interviews with our youth, they expressed the need to be better prepared for the technological world. Additionally, they felt it was important that having a strong sense of their Nishnaabe identity was essential to their success. Not having been exposed to their traditional language and what it contains, our youth do not understand the profound sense of loss that our culture has suffered or the depth of the benefits one can receive from acquiring their language. Our initial application failed to identify this as a potential drawback to achieving our outcomes. This is addressed in our final proposal by creating a series of videos that provides an inside look at the philosophy embedded in the language and how it expresses our unique worldview. It is our intention that these videos, along with teachings from our elders, will provide our youth and other community members with the motivation to begin their language acquisition journey.

We engaged the youth through some of their established groups. Additionally, we hosted special events at their local high school, sponsored community events, conducted a youth survey, and talked to them in various public functions and locations. Several new initiatives are currently underway with our departments that aim to increase youth involvement. Our Smart Cities team have provided input into the establishment of these new initiatives and will utilise these structures to increase youth engagement. The new approaches are youth-driven.

Parents

Projects aimed at our children will be more successful with the support of their parents. Our parental engagement findings showed an overall support of the proposal. Parents understood the importance of preparing our children and youth for the technological world. Additionally, they acknowledged the importance of language, culture and land to identity and how this was important to living good lives.

One of the biggest impacts resulting from our consultations with parents was their personal fear in not having knowledge of STEM or the language. This translated into building into our proposal strategies to help educate our parents and provide resources on how they can support their children's language acquisition and STEM learning journeys. Including supports for parents has now become an important addition to our proposal. We will incorporate strategies that facilitate family learning. Overall, the parents were excited about the new possibilities for their children and several thought perhaps they should go back to kindergarten.

Parents understood that this proposal would produce understanders of the language. They wanted reassurance that the resources necessary to move from being an understander to becoming a speaker will be available. Our 2019 survey and 2006 survey clearly state that language revitalization is a community priority and creating speakers is our ultimate goal.

We utilized surveys, community meetings, and small group discussions, as the means to obtain parental engagement. Our education staff took opportunities inside their system to engage the parents and introduce them to STEM. We have strengthened our strategies to encourage and empower our parents as they support their children's education journey. Continued parental engagement throughout the proposal implementation is important to achieving the outcomes for our children.

Biigtigong Education Staff

Biigtigong has a well-established, creative and results-driven Education team. Their participation in the development of the proposal has been important and has resulted in substantial contributions to ensuring the successful

implementation of our proposal. They have identified solutions to potential problems and have substantially improved the quality of the proposal.

They have been extensively involved throughout the entire process, from visioning, to curriculum reviews and development, education philosophy and pedagogy reviews, assessment and evaluation development, privacy and data, student needs and support, student learning styles, immersion video production, professional development and capacity building, co-operative education models and re- imaging a new education model. The application of the resources developed through this proposal will be subject to the rules and regulations of the Education Department. The education department will maintain responsibility for the monitoring of individual student assessments and the overall education mandate.

Through pilot projects and professional development initiatives, the staff had the opportunity to facilitate student learning in the area of technology and engineering. This was particularly challenging, as the teachers had little to no knowledge of either fields or experience using on-line resources in these fields. This work resulted in wonderful lessons but the most important take away is the creation of a team excited to take on the world of technology, engineering and language acquisition. Our education department and our Smart Cities team has developed a training strategy to support teachers with STEM, language and and blended learning education.

One of the major changes resulting from the engagement with the education staff relates directly to our initial goals in the secondary school program. The staff highlighted the limitations of secondary level courses as it related to our initial vision. As a result, we had to go back to the drawing board and find other ways to implement our vision. This turned out to be such a wonderful problem, which initially seemed insurmountable. This led to the development of a much more supported and comprehensive high-school program. It now provides high-school credits, real technology and engineering co-ops, summer internships and employment, youth owned and run business, career support and mentorship.

Our engagement with our education staff has been extensive and will continue to be so. We have utilized surveys, focus group discussions, small group discussions, pilot projects, training sessions, staff meetings, on-line resources, collaborative tools, and cultural events to engage our education team. We

have created an organizational culture that supports and empowers our staff. The success of our Smart Cities proposal is increased by meaningful engagement and empowerment of our Education team.

Off-Reserve Members

The Smart Cities proposal provides an opportunity to strengthen the community bonds between on- reserve and off-reserve members. Through our on-line platform, off-reserve members will have the opportunity to access important community data relating to their language and aadsookaanan. Additionally, they will have access to any programs developed by the community that support STEM on-line. The meet-up-app will also help facilitate opportunities to return home to their traditional territory and participate in person with the community.

Our off-reserve members indicated support for the proposal goals and were excited about the opportunity to acquire their language from the comforts of their home. Engagement results reiterated the need to more effectively utilize technology to build stronger relationships and inclusion of off-reserve members into the building of our Nation.

Our engagement with off-reserve members included a survey, a meeting in Thunder Bay, availability of live-streamed community meetings, conference call meetings and web-site information. Our plan moving forward includes strategies to increase off-reserve participation and engagement.

Community Members at-large

Various engagement activities were held for the general population. These events included, luncheon talks, large community presentations, small group sessions, social events, survey, live-streamed community meetings, newsletters, web sites, email and social media. We received tremendous support for the project through the high levels of participation in the engagement sessions. Our general sessions were well attended and our survey return rate was high. The responses shaped our proposal by confirming we are on the right path and the community is behind the goals set forth in our proposal. Community support is very important to the successful implementation of our proposal. It does take a whole community to raise a

child.

STEM Professionals and Academia

In order to ensure our proposal is academically feasible and provides a solid foundation for entry into related post-secondary programs or employment fields, we engaged various STEM professionals from the business and academic sectors. The information and insights provided by this group has significantly impacted our proposal. They played instrumental roles in selecting the curriculum and developing a sequencing of skills and knowledge. Their expertise provided us with the guidance to develop a high level K-12 STEM program, with ambitious and achievable goals. Their continued involvement in the project will ensure our programs meet the needs of our students and the ever-changing needs of the industry.

Engagement Tools

A variety of methods were used during the proposal development stage to achieve high participation rates amongst the stakeholders. Upon the completion of stakeholder analysis, where a careful review of the potential risks, interests and benefits were identified, engagement strategies were designed to suit the specifics of each group. Engagement tools were purposely selected and customized for each of our stakeholder groups. In addition to selecting appropriate tools, the presentation itself was customized for the specific audiences.

Individuals who had experience working with each of the stakeholder groups were invited to assist in the design and the development of a best-suited approach to the consultations. Involving these individuals increased our efforts of engagement to produce meaningful results and strong community buy-in and support. A list of tools used is attached as Appendix Z.

Summary of Engagement to-date

Our engagement plans to date has resulted in the successful participation from our residents and the diverse stakeholders of the project. We believe our processes were meaningful and facilitated honest and open discussions. As a community, we explored the potential barriers and risks to our success and

found creative solutions to address them. We embraced the opportunities and strategically developed a difficult but implementable proposal that will make profound impacts forever. We understand the importance of engagement and make this foundational to how we build our Nation.

Part III: Engagement During Implementation

We are building upon the successes of our engagement during the final proposal development phase. Our plans for engagement during the implementation stage are aimed to foster high levels of community engagement from the diverse stakeholders. The engagement processes are intended to ensure the needs of the community are being met and the program meets its expected outcomes. The engagement process will foster community development, inclusion and provide a rallying point for members to make meaningful contributions to helping transform our youth into better educated, more employable, better grounded and more holistically Nishnaabe people.

Formal Leadership

The following will be implemented to ensure meaningful and continued engagement with our formal leaders to support the attainment of the proposal outcomes:

1. Smart Cities Executive Board: The Chief and Council and the Senior Management Team will each have a representative on the Smart Cities Executive Board. Each will be coordinate engagement with their respective group.
2. Senior Management Team: An Executive Board representative will participate in quarterly meetings.
3. Bi-monthly report: A video report will be made available to provide education, accountability and foster engagement on the project.
4. Annual Report: Produce an annual report to Council, Senior Management and Community.
5. Ceremony: Elders will be invited to an annual ceremony where we honour the goals of our proposal and ask for help and guidance from our ancestors.

Elders

The following will be implemented to ensure meaningful and continued engagement with our elders to support the attainment of the proposal outcomes:

1. Aadsookaanan Working Group: This group is comprised of elders, language carriers, traditional knowledge holders, youth, parents and technical personnel. They will work collectively with the aadsookaanan research and reconstruction team. They will act as the advisory body and assist in the decision-making process regarding aadsookaanan reconstruction. Additionally, they will report to the Executive Board who is responsible for the overall proposal. This group will remain in affect for the entire implementation stage and will meet no less than quarterly and more frequently when required. The group will coordinate community engagement sessions regarding the aadsookaanan project to keep the community informed and involved.
2. 50+ Elders Group, TEK Working Group, Place-Name Reclamation Working Group: Bi-annual engagement events will be held specifically with each of these existing community elder groups.
3. Pop-Up Engagement Sessions: We will host at minimum one pop-up Smart Cities fun and informative pop-up engagement session. These sessions will be held in support of existing annual community events, such as, moose-camp, addictions awareness week, fish-camp.
4. Ceremony: Elders will be invited to an annual ceremony where we honour the goals of our proposal and ask for help and guidance from our ancestors.
5. Bi-monthly Report: A video report will be made available to provide education, accountability and foster engagement on the project.
6. Annual Report: Produce and annual report to Council, Senior Management and Community.

Biigtigong Youth

The following will be implemented to ensure meaningful and continued engagement with our youth to support the attainment of the proposal outcomes:

1. Executive Board Seats: Two seats on the Executive Board will be reserved for youth representation. The seats will hold the same responsibility and influence as all other seats on the committee. The youth representatives will be responsible for coordinating the youth engagement strategies.
2. Biigtigong Youth Council: We will utilize the Youth Council to assist in the coordination of joint initiatives aimed at youth engagement.
3. In-school Engagement: We will host one in-school engagement session per semester.
4. Pop-Up Engagement Sessions: We will host at minimum one pop-up Smart Cities fun and informative pop-up engagement session. These sessions will be held in support of existing annual community events, such as, moose-camp, addictions awareness week, fish-camp.
5. Formal Evaluation: Our youth will be involved in the evaluation of the proposal activities and in the development of strategies to strengthen the program.
6. Celebration of Achievements: A celebration of student achievements as they r elated to the outcomes of this project will be planned each year.
7. Bi-monthly report: A video report will be made available to provide education, accountability and foster engagement on the project.
8. Annual Report: Produce and annual report to Council, Senior Management and Community.

Parents

The following will be implemented to ensure meaningful and continued engagement with our parents to support the attainment of the proposal outcomes:

1. Education Committee: An Executive Board member will work with the Education Committee to engage and inform parents.
2. Child and Family Learning Centre Parent Committee: An Executive Board member will attend 1 parent meeting per year, or as requested.
3. Existing In-School Parent Engagement Activities: Parents will be engaged through parent-teacher interviews, open-houses, progress reports, on-line media and other in-school engagement processes.
4. Parent and Student Cohort Support Program: A special program will be set up for the parents and students for the 2019 cohort moving into the CompTIA A+ program. This program will provide various support services for the duration of the program. Parents will have an opportunity to help adapt the program in order to better serve youth success.

5. On-line workshops for parents: A series of on-line interactive workshops will be held for parents to help them engage in the learning journey of their children.
6. Formal Evaluation: Our parents will be involved in the evaluation of the proposal activities and in the development of strategies to strengthen the program.
7. Bi-monthly report: A video report will be made available to provide education, accountability and foster engagement on the project.
8. Annual Report: Produce and annual report to Council, Senior Management and Community.
9. Pop-up Engagement Session: We will host at minimum one pop-up Smart Cities fun and informative pop-up engagement session. These sessions will be held in support of existing annual community events, such as, moose-camp, addictions awareness week, fish-camp.

Off-reserve Members

The following will be implemented to ensure meaningful and continued engagement with our off-reserve members to support the attainment of the proposal outcomes:

1. Off-reserve meetings: A minimum of one in-person meeting will occur with off-reserve members.
2. Live-stream video: All community meetings will be live-streamed to encourage off-reserve members.
3. Webinars: Two Webinars will be held annually for post-secondary students and off-reserve members.
4. Formal Evaluation: Our youth will be involved in the evaluation of the proposal activities and in the development of strategies to strengthen the program.
5. Bi-monthly report: A video report will be made available to provide education, accountability and foster engagement on the project.
6. Annual Report: Produce and annual report to Council, Senior Management and Community.

Community at large

The following will be implemented to ensure meaningful and continued engagement with our community to support the attainment of the proposal outcomes:

1. Community Meeting: A minimum of one in person meeting will occur with on-reserve members.
2. Live-stream video: All community meetings will be live-streamed to encourage off-reserve members.
3. Nishnaabe Clan System: A new engagement system based on our clan system will be introduced for the first time. This is an extensive engagement process that is designed to include all sectors of the community. This system will be used as one of our primary methods of community engagement.
4. Formal Evaluation: Our youth will be involved in the evaluation of the proposal activities and in the development of strategies to strengthen the program.
5. Bi-monthly report: A video report will be made available to provide education, accountability and foster engagement on the project.
6. Annual Report: Produce and annual report to Council, Senior Management and Community.

Nishnaabe Clan System

Reconstruction and reclamation of our ancient Nishnaabe ways is a central to our vision. In keeping with the spirit of our vision, we intend to utilize our traditional clan system as the primary method to our engagement strategy. The clan system is built upon principles that are foundational to our world-view and philosophical understanding of our world. These principles capture cultural values, such as, non- hierarchical structures, cooperation, collaboration, reciprocity, communal living and promotes the importance of relationships.

Our clan systems are reflective our cultural structures that emerges from our relationships with the land and a naturalistic cosmology. We look to the natural world and the laws that exist on the Earth, as our guiding principles for the development of our systems and structures. Our clan systems consist of seven primary clans: Loon, Crane, Fish, Bird, Bear, Marten and Deer, each

having several sub-clans. Each clan has adopted a spirit animal as their totem and this animal is a symbol of how the members of each clan should conduct themselves and relate to the world.

This system organizes work and establishes responsibilities of individuals and the collective. Each clan holds specific duties and responsibilities to take care of the physical, mental, emotional and spiritual needs of the community. Some of these responsibilities include, philosophy, law making, decision- making and enforcement, governance, learning and teaching, communication, economics, trade, defense, child rearing, providing, conflict resolution, and strategy. The clan teachings are agreements that govern how individuals and families take care of each other and the community as a whole.

We are choosing to implement our clan system for the first time within a modern context. We will utilize the clan structure and protocols for the purpose of community engagement. Each clan will appoint a representative to the main clan body. The main body will work with the Executive Board, to determine the most effective and productive strategies to empower and engage our residents. Each clan leader reports directly to his/her clan and the clan determines how they will involve the members of their clan in the process. Clans determine their own internal methods of communication and decision-making. Individual clan decisions are brought back to the main clan and our consensus decision-making model and dispute resolution models will govern the process. This is the basis of our engagement plan.

Risks and Mitigation Strategies

Our approach to risk and how we determine and mitigate or avoid risk is discussed in Chapter 3. This table summarizes the risks associated with community engagement and the risk management approach and mitigating actions to be taken.

Risk	Likelihood	Impact	Risk Management Approach/Mitigating Actions
Lack of Support of the proposal	Low	High	• Establish meaningful process • Be accountable & report • Provide education
Loss of faith and trust if there is no consistent follow-up by staff.	Low	High	• Establish measureable goals. • Plan for short term achievements • Set achievable action plans • Be accountable and transparent
Unrealistic stakeholder expectations and demands.	Medium	Medium	• Be clear about the reasons for engagement • Clear and consistent communication • Provide education • Dispute resolution process
Lack of interest	Medium	Medium	• Select group appropriate strategies • Know your audience • Ensure the activities are fun, social and specific to your audience
People made feel excluded	Low	Medium	• Use existing networks and structures • Provide several opportunities for people to have input • Ensure culturally appropriate methods • Customize approach to audience we
Limited knowledge on clan system	High	Medium	• Utilize knowledge holders in community • Conduct research • Bring in elders who know about clans • Training • Ceremony
Triggers trauma – direct and inter-generational	Medium	High	• Create awareness of possibility – share previous examples/similar stories • Include ceremony • Social Services support programs • Cultural Coordinator support programs
Don't meet outcomes	Low	High	• Set up good planning • Realistic outcomes – needs based – measurable • Set up reporting and accountability • Supportive budget, governance systems, management system
People are not aware of what's going on	Medium	Medium	• Communications plan • Use various approaches to inform people • Be creative – go to them
Lack of time	Medium	Medium	• Live stream meetings • Use BiigtigongX • Provide information to them – video, tv, print, car, phone • Make it interesting, fun and useful

Chapter 7 – Data and privacy

Winners will leverage data for projects that use connected technologies and in turn, harvest the data that they generate to, among other things, achieve efficiencies, inform decision-making, and improve the performance and application of the technologies themselves. Winners will also, to the extent possible, make data available publicly, build analytics in-house, and avoid being locked in with specific vendors in a way that hinders them and other communities from leveraging the data. At the same time, winners will need to secure highly sensitive data, defend against security breaches, and protect personal information and privacy. This chapter serves as a demonstration of your commitment to responsibly managing data through its lifecycle with security and privacy considerations addressed.

Appendix 3 (page 26) provides detailed guidance on data and privacy considerations.

Provide a data management plan for the implementation phase, including:

- *Preliminary Privacy Impact Assessment (PIA) or Preliminary Rationale Analysis (PRA) with evidence that relevant privacy authorities were consulted and their guidance was considered in its development*
- *The ways in which the data management plan complies with Personal Information Protection and Electronic Documents Act (PIPEDA) and other relevant municipal, provincial/territorial, or federal privacy regimes*
- *Types and methods of data collection, generation, analysis, storage, and transmission, and plans for re-use, re-distribution, derivative production, archiving, and preservation that reflects the entire data lifecycle in project design*
- *Efforts made to integrate security and privacy considerations into project design, particularly those that were raised by users, residents, and other stakeholders*
- *Efforts made to adhere to the following principles:*
    - *Governance: strong governance frameworks and meaningful resident engagement throughout the lifecycle of projects*
    - *Ownership and control: avoidance of private-sector ownership and control of publicly- sourced data and community-owned and controlled data approaches*
    - *Consent: respect for meaningful consent in data collection, use, and disclosure*

    - *Data minimization and de-identification: pursuit of less privacy-invasive alternatives wherever possible and de-identification of all personal information at the earliest opportunity and mitigation of potential for re-identification*
    - *Accessibility: accessible, interoperable, and open data approaches to drive community-based solutions*
    - *Security: secure storage and transmission of data and assurance of effective cybersecurity*
- *Open and big data strategies, including the ways in which they facilitate transferability and replicability of technologies and projects*
- *Identification of risks and development of appropriate mitigation strategies*
- *Other details, as required*

Evaluation criteria

- *Plan is detailed, complete, high quality, and well-suited to achievement of outcomes*
- *Plan supports the implementation of projects*
- *Open and big data strategies are employed to the extent possible and facilitate transferability and replicability of technologies and projects*
- *Risk strategy is thorough and adequately addresses key risks*

Chapter 7 – Data and privacy

Introduction

Privacy is of the utmost importance to our leadership, project team and community as a whole. Given that this project entails a blended learning environment of both online and real-world opportunities this project will result in the generation of new data from users creating accounts on the Open edX platform. As such, it is critical that this project be developed and implemented with significant consideration given to privacy and data security. The following chapter outlines our data management plan.

Preliminary Privacy Impact Assessment (PIA)

Given that this project involves the collection of some personal data, it is necessary to complete a Privacy Impact Assessment (PIA). In preparing this proposal, the project team has completed a preliminary privacy impact assessment through reliance on applicable regulations and our internal governance strategy and through incorporating feedback from the Office of the Privacy Commissioner of Canada. The PIA is submitted under separate cover.

The Preliminary PIA covers all proposed activities under the SMART Cities project, including how data will be sourced and accessed through the Open edX platform. Considerations have also been made for: Data Storage, Data Access, Data Retention and Data Disposal required throughout the lifespan of this project. The project team will continue to assess the project's privacy risks and impact to determine if there is a need to update the privacy analysis and/or the PIA report. This ongoing assessment is an essential part of identifying and mitigating new issues and changes impacting privacy that may arise during the implementation phases.

This Chapter of the Smart Cities Challenge includes much of the information included in the preliminary PIA, as well as additional details as specified.

Compliance with Applicable regulations.

The following table outlines the result of our compliance analysis:

Policy Process Statement	Process and Compliance measures
Purpose of the collection of personal information	This project involves creating a blended learning environment with both online and real-world components. The nature of an online learning environment results in the collection of minimal personal information to create an account, name, user name and password. Additionally, certain functionalities of the Open edX platform, such as the meetup application or time spent watching videos, will also generate data on a user's location and behavior patterns. Another source of data is the videos, stories, overdubbing etc. that will be created for the language immersion education and STEM bilingual courses portion of the project. This data will be stored on the Open edX platform as well as in a redundant hard-copy format (ie, transcripts, tapes etc) to ensure data is not lost. There are no additional privacy concerns associated with storing physical copies of the educational materials. All information identified is absolutely necessary for participating in the project and/or for monitoring the success of the project
Source of personal information/ Accuracy	Initial data will be provided directly by users to generate their profile and then data will be tracked using their Open edX account. For example, it will be necessary to track users time spent watching video to provide assurance that the student has completed the necessary videos for completing the curriculum requirements. Given that the curriculum will be developed in a blended learning environment (brick and mortar and online) this will only include the collection of data related to activities completed in the Open edX platform. Activities completed within the brick and mortar school will continue to be tracked by teaching staff under existing processes. Qualitative data will also be collected by teachers for users to inform feedback on the project, monitoring, evaluation and control purposes. Personal information will be collected directly from the Open edX platform by teaching staff only. Collection of data from teaching staff will be required and is appropriate given the context of this project. Given that information is provided directly by the user through the online platform, we do not anticipate any major inaccuracies. Likewise, the anonymized and summarized data to be provided by teaching staff is subject to their current process which ensure accuracy and privacy of student information.
Accountability and Openness	The project team is accountable for the data collection, management and safeguarding results from this project. The project team has intentionally minimized the amount of personal information to be collected through use of Open edX platform, as users will only need to provide their name, user name and password to create an account. Likewise, we will implement a process that enables students and their legal guardians to provide informed consent to participate in this voluntary process, thus ensuring they understand what information will be collected, why, and who will have access to it.
Manner of collection of personal information	The data to be collected is minimal and relatively not intrusive. It is similar (if not identical) to the information already being collected and managed by the school system. Similarly, the information collected via the Open edX platform is typical for any online platform. Use of the meet up application is voluntary, and any users will be provided a privacy statement to agree to prior to using this forum (i.e. authorizing sharing of user location data)
Limiting Use, disclosure and Retention	Teaching staff are already subject to policies and codes of conduct that govern how they treat personal information, through to physical or technical controls that protect the information. Safeguards that will be into place include physical security; IT security; staff training; policies, confidentiality clauses in contracts with external providers etc. Information, such as language videos, transcripts etc. are to be stored indefinitely as these are important records of our language and traditional teaching that we are attempting to preserve as part of this project. Personal information will only be used for the purpose it was collected for, and as described. The personal information collected for the students will only be retained until graduation. Following successful graduation, all student data will be removed from the server and student accounts will be disabled. The collection, use, retention and disclosure of personal data, and particularly student data, should always be limited to what is necessary to fulfill authorized purposes. Reducing the risk posed by the excessive collection of student data is a core principle that guides this project's data processing practices.
Access and correction to personal information	Users will be able to access the account information on the Open edX platform. Information collected by teachers will be subject to the policies and procedures currently in place in the school system. Information will be shared with students and parents through existing channels (i.e. report cards). Access logs will be implemented to track access to personal information. Teachers can correct their existing report card writing process based on information collected. For example, should a student choose not to use the meet up forum, the teacher would reflect the true involvement in traditional activities in that student's report card, regardless of the data output from Open edX. Requests for personal information to be corrected will be handled on a case by case basis. However, we do not anticipate any major concerns with meeting this principle as all information collected is basic in nature and expect most changes, if any would be minor in nature such as their name, username or password changes.
Accuracy etc. of personal information	Given that information is provided directly and automatically by the user through the online platform, we do not anticipate any major inaccuracies. Likewise the anonymized and summarized data to be provided by teaching staff is subject to their current process which ensure accuracy and privacy of student information. The process for anonymizing the data will involve the teaching staff providing the project team a summary report detailing quantitative data needed to provide details needed to track and report on performance indicators. This will include: • number of K-12 STEM courses successfully completed by K-12 students • number K-12 students needing remedial help in STEM subject areas • number of K-12 students who know the key concepts expressed in each of our core audiobookmaan • participation rate in number of traditional Nisimaabe activities for K-12 Students No personal or identifying information will be shared, nor will it be required, by the project team. The summarized data, omitting all personal information, is required by the project team to track, monitor and evaluate the implementation of the project, and to make course corrections when necessary. Qualitative data will also be collected for teachers to provide feedback on the project, for monitoring, evaluation and control purposes.
Data Disposal	Data stored on the Open edX platform will be expunged following a student's graduation.

Data Management process

This section outlines the types and methods of data collection, generation, analysis, storage, and preservation that reflects the entire data lifecycle in

project design. The Data to be collected during this project is associated with the inputs and outputs, as described in our performance measurement strategy presented in Chapter 2.

Step 1: Gain informed Consent:

In order to ensure participants (and their legal guardians) make an informed decision when providing their consent to participate in the Open edX platform, a privacy seminar will be held at the community centre prior to program roll out. During this seminar, the project team will review the project and the content of this Privacy Impact Assessment to ensure participants (and their guardians) are knowledgeable of the inherent risks of participating in a partially-online learning platform. This seminar will overview what information will be collected and why, who will have access to this information once an account has been created and what agreements are in place (at that time) with all 3rd party providers. This seminar will also allow community members to voice their privacy concerns with respect to participating in an online environment. The project team will also present the policies and procedures developed thus far to mitigate any identified privacy risks and how any data breaches will be managed, as described within this document and further iterations of the PIA.

Should students, or their legal guardians, opt-out of the online-augmented (i.e., blended-learning) program, they will be given alternative means of participating in the K-12 curriculum at the brick and mortar school. It is important to note the participation in this Open edX platform is 100% voluntary and if not adopted will not diminish the learning of non-participates. Participants and their guardians will be provided a consent form outlining the privacy concerns and risks, for review and signature prior to enrolling in the Open edX platform.

It should be noted that as outlined in the PIA, in an effort to mitigate risks, the project team will work with Technology/Software providers, including Open edX to enter into a contractual agreement which will ensure personal information is handled in a privacy-compliant manner, and restricts the third party's use of personal information for proposes outside the project scope. In all cases the user will be advised about any third party's privacy policies/statements when directed to a third-party site for additional links or

resources, as part of informed consent process.

Step 2: Personal Information Data Collection

Users of the Open edX platform will be required to provide the following types of personal information. This information will then be use by teaching Staff to offer better service to participants.

- Account creation and login information, including user name and password *
- Location information – anytime the student interacts with Open edX platform, location data is generated **
- Patterns of behaviour (which educational video were watched and for how long)

* Students will not be asked to provide their address, date of birth or other identifying information for the purposes of setting up an account with Open edX. The intent of collecting a user name and password is only to allow a student to create an account and login to the Open edX platform and to enable teachers to track a student's progress.

** Due to the very nature of the internet anytime a person connects, the media that is being delivered to that person is tracked using a particular 'IP address.' Location data is then deduced from that IP address. There is no reasonable (or perhaps possible) way to interact with the internet without generating location data. Total location privacy is not possible within the current organization of the internet since IP addressing is a foundational part of the internet. As such we can only attempt to maximize our privacy online – while accepting that our location will always be exposed.

Step 3: Data Analysis

Information to be collected will include the name/user name of the student and the amount of time a student spends watching a video, as well as any participation in any traditional activities as tracked through the meetup forum functionality. Similarly, should students identify participation in traditional activities through the meetup forum functionality of Open edX, this will

generate location data.

No additional information will be provided regarding the student's performance in other school programs. Again, this is a voluntary blended-learning environment (online and/or brick-and-mortar, but not online only) and therefore the intent is to not replace what is currently being done at the school level. All collection of student data will be limited to what is needed for educational purposes.

Teaching staff are the only project resources who will have access to the student specific data. No other project team member will have access to individual student specific information. No information will be made public. Teachers require access to student specific data as it is needed ensure a student has completed the required curriculum. Behaviour data is also required to make teachers aware of how long a student struggled with a particular math problem, or how many times the student rewatched a video, and which sections of the video were rewatched, for example. This is one of the main benefits of using a blended-learning approach as this "behavioural pattern" data is what helps our teachers teach more effectively.

Teachers will not provide information about a student to Open edX nor to Appsembler. The flow of information is from student to Open edX to teacher, which is then provided back to the student in the form of a report card and to the project team in the form of aggregated summary data for performance measurement tracking only. In other words. Teachers will summarize the data and submit to the project team for performance monitoring and process improvements.

With respect to information collected by 3rd parties, this will all be as per the contractual agreement. All terms of these agreements and risks to privacy resulting form 3rd party platforms and software will be communicated to users (and guardians) as part of the informed consent process.

Step 4: Store and Dispose of Data

Minimal student data will be stored on Open edX platform, over the course of their school. Data stored by teachers (i.e. in the form of records and report cards) is governed by their existing policies and procedures. With respect to

input data such as the videos, stories, overdubbing, etc. that will be created for the language immersion education and STEM bilingual courses portion of the project. This data will be stored on the Open edX platform as well as in a redundant hard-copy format (i.e., transcripts, tapes, etc.) to ensure data is not lost. There are no additional privacy concerns associated with storing physical copies of the educational materials. All information identified is absolutely necessary for implementing the project, participating in the project and/or for monitoring the success of the project. Student data stored on the Open edX platform will be expunged following a student's graduation.

Other Uses

There are no plans for and transmission, and plans for re-use, re-distribution, derivative production, archiving, student personal data. All other data, including videos, are to be made publicly available.

Open and Big Data Strategies

Only once this framework is expanded to different communities with different objectives will the use of big data be necessary to track the different uses and functions of this curriculum. At this point, open data will be used to report progress, engagement, best practices, etc. This information will not pertain to specific individuals, but specific user bases as whole. For example, data may summarize user rates, and immersion progress of a specific community, but not specific students of that community. Risks and Mitigation Strategies are discussed throughout this chapter (and others). Three key risks are summarized in the table below:

Privacy Risks and Mitigating Strategies

Risk	Mitigating Strategy
Use of information by 3rd parties	The project team will work with Technology/Software providers, including Open edX to enter into a contractual agreement which will ensure personal information is handled in a privacy-compliant manner, and restricts the third party's use of personal information for proposes outside the project scope. In all cases the user will be advised about any third party's privacy policies/statements when directed to a third-party site for additional links or resources, as part of informed consent process.
Security Breach	The project team will develop and implement a breach response policy and protocol that addresses privacy and security risks for both the online and offline platform/storage methods. Information custodians, namely Teaching staff, Chief and council, and the database administrator must immediately contact the Database administer and Privacy Officer, informing him of the following: • the nature of the breach; • the information that was exposed; • to whom it was exposed; and • for how long it was exposed. The Information Custodian will work with the Privacy Officer who will advise whether notice to affected individuals and the Office of the Information and Privacy Commissioner of Ontario (IPC) is required. If such notice required, the Privacy Officer will work with the information custodian to meet the needs of the IPC.
3rd party software/technology becomes outdated	Reliance will be placed on existing websites for STEM education (i.e. code.org). As these are established organizations, that are constantly updating and revising content to better engage youth and other users in this field, there is some chance that this 3rd party software at some point may become dated. However, SMEs will continuously monitor content and explore alternatives should the desired content become outdated or unavailable

Chapter 8 – Financial

In this chapter, you are asked to demonstrate how you plan on spending your prize money while following sound financial practices in estimating and managing funding, expenditures, and revenues for all of your projects. Winners will not be required to match funding—the Challenge provides up to 100% of project costs up to the total prize amount. However, winners are encouraged to leverage additional resources, where doing so increases the impact of projects.

Provide a financial plan for the implementation phase, including:

- *Comprehensive project budget with a detailed breakdown of projected revenues, if any, and expenses by year, source, and cost type (including identification of hard and soft as well as direct and indirect costs) that is reasonable, sufficient, and in line with the performance measurement plan*
- *Methods, sources, and assumptions that result in class B (substantive) estimates at a minimum*
- *Contributions (financial or in-kind) from other sources, and approach to leverage revenues, if any, and the prize money that amplifies the impact and reach of projects*
- *Financial tools and accounting methodologies that are appropriate for projects*
- *Identification of risks and development of appropriate mitigation strategies*
- *Report on the use of the finalist grant, including reasonable justification of any divergences from the plan laid out in the application*
- *Other details, as required*

Evaluation criteria

- *Plan is detailed, complete, high quality, and well-suited to achievement of outcomes*
- *Plan supports the implementation of projects*
- *Report on the use of the finalist grant is detailed, complete, and demonstrates a rational and effective use for the development of the final proposal and sound management of project funding*
- *Risk strategy is thorough and adequately addresses key risks*

Chapter 8 – Financial

Introduction

Biigtigong has a responsibility to its citizens to accurately account for public funds, to manage its finances effectively and efficiency, and to plan to provide quality needs-based services. As a government we are responsible for implementing effective systems of public financial management and for utilizing these systems to safeguard public assets. The effective management of public finances is fundamental to the development and growth of the community.

Financial management is a critical prerequisite for success. It is an integrated process that brings together strategic planning, budgeting, accounting, reporting, controls, procurement, auditing, policy and people with the goal of managing resources strategically to achieve the project's outcomes. Effective financial management includes planning, organizing, directing and controlling the financial activities to support the organization's goals.

Authority

Biigtigong's Constitution assigns Chief and Council the responsibility to effectively and efficiently manage and control public funds. They have the authority to establish institutions and appropriate legislation, polices and procedures, with supporting governance structures, to govern the financial matters of the First Nation. The Constitution recognizes the leadership's responsibility for accountability, transparency and results.

Financial Management Objectives

Biigtigong's financial management objectives are as follows:

- To enable the delivery of quality services to our membership that are geared to meet their needs.
- To make effective and efficient use of the available resources.
- Be accountable to our membership and other stakeholders.
- Prepare for long-term sustainability.

- Manage risks.

Sustainability and Diversification

The goals of our Smart Cities proposal are aligned and part of Biigtigong's bigger and longer-term vision. As such, it is not considered an independent project, with a start and end date. Our five-year implementation stage is designed to develop the necessary resources and capacities to ensure long-term sustainability of the program goals and objectives. As we begin our implementation, collaborative efforts with our internal departments on specific aspects of our proposal are setting the stage for long-term sustainability and integration.

Governance Structure

Establishing appropriate governance structures that support and facilitate the delivery of our programs and services to our membership is part of an effective financial management plan. Chapter 5 describes the governance structures.

Responsibilities

Establishing clear roles and responsibilities and ensuring a shared understanding of these roles are important to sound financial management. Financial management roles and responsibilities are defined in the financial polices. In addition, these are reiterated in the details of job descriptions, department mandates and terms of references for committees and boards. All of these are in place for the Smart Cities proposal implementation.

The Chief and Council's primary responsibility is to establish appropriate laws and policies to govern the sound financial management of finances. Management is responsible for the implementation of these laws and policies and ensuring adequate procedures and systems are in place for support. Management is responsible for communicating the expectation and duties to staff. Staff and operating personnel are responsible for carrying out the internal control activities set forth my management.

Transparency

Creating a culture of transparency throughout the organization is one of the foundations of sound financial management. Developing principles of careful budgeting, reporting and auditing, combined with internal controls and transparency ensures a robust system of financial management.

The following provides some measures that Council has taken to provide transparency:

- Open Council meetings; public access to by-laws, minutes and reports.
- Council publishes the annual approved budget and financial statements.
- We have expanded our Internet and social media presence including some online services.
- Feedback and complaint mechanism are in place.
- Procurement policy is comprehensive and regulates the procurement of goods and services, including human resources.
- Conflict of Interest policy guides the disclosure and management of conflicts of interest.
- Codes of Conduct are established for members of Council, management, staff, committee members and the membership.
- Public access to information is guided by policy.
- Extensive community engagement culture; continuous opportunity for community to be involved in the decision-making processes.

Our Smart Cities team will adhere to the regulations and expectations established by Council via their formal and informal policies. Our team is committed to building an open and transparent relationship with all of our stakeholders. Transparency is of special importance to our team, as we are making new paths and facilitating a significant change at the community level and establishing trust is important. We will create opportunities to be transparent and ensure our organizational culture and systems support transparency.

Rigorous Internal Controls

Internal controls ensure that the organization is in compliance with laws and regulations and protects assets against theft and misappropriation. In general, segregation of financial duties to provide a set of checks and balances, proper

authorization of expenditures, physical control of assets, and maintenance of records and documents supporting financial activities are the foundation of an adequate control environment. Sound financial management also requires regular reconciliation and review to ensure that activities reported in the organization's accounting records are crosschecked against the supporting documents.

Internal control is all of the policies and procedures management uses to achieve the following goals:

- Safeguard assets – Well-designed internal controls protect assets from misappropriation of public funds, accidental loss or loss from fraud.
- Ensure the reliability and integrity of financial information – Internal controls ensure that management has accurate, timely and complete information, including accounting records, in order to plan, monitor and report business operations.
- Ensure compliance – Internal controls help to ensure the First Nation is in compliance with the many federal and local laws and regulations affecting the operations of our business.
- Promote efficient and effective operations – Internal controls provide an environment in which managers and staff can maximize the efficiency and effectiveness of their operations.
- Accomplishment of goals and objectives – Internal controls system provide a mechanism for management to monitor the achievement of operational goals and objectives.

Our finance policy and operating procedures identify the internal controls that are mandatory for all operations. These controls are regularly reviewed and adjusted accordingly in our efforts for continuous improvement. Our Finance and Audit Committee, in conjunction with our Senior Management Team, provide Council with recommendations for improvement. The implementation of our Smart Cities proposal will be subject to the internal controls and procedures as established by our financial management systems.

Finance Policy Manual

Our finance policy manual is the central means to communicate the financial controls and responsibilities. In order to successfully mange a project a

coherent set of accounting procedures and standards are required. Our finance policy manual addresses the following matters:

- Delegated and Assigned Responsibility
- Planning and Budgeting
- Tangible Capital Assets
- Investments
- Procurement
- Payroll
- Benefits
- Travel and Training
- Loans, Guarantees and Indemnities
- Expenditures and Payables
- Borrowing/Debt
- Financial Reporting
- Insurance
- Records Management and Retention
- Risk Management
- Information Technology
- External Audit

Financial Management Software

Biigtigong utilizes a financial management software program named Xyntax, specifically designed to meet the financial needs of First Nations. The software manages all accounting procedures of the organization, such as cash flow management, general ledger, expenses, payments, assets, income and purchasing. It efficiently manages all financial administrative processes. The software is customizable to suit the specific needs of our organization. The staff who will be assigned the responsibility of financial management are familiar with and have extensive experience with the financial management software that will be used for the Smart Cities project. The software will also allow for specific project codes that could coincide with the identified outcomes and milestones.

Accounting Methodologies

Biigtigong utilizes project based accounting. Project accounting tracks all the financial components of a project. It provides access to more accurate and

timely information when making decisions. It allows for an actual-to-budget analysis. Project accounting provides for more accurate accounting of project job costs. It provides for a more credible audit process and facilitates better control over projects. Project accounting also can help gauge the team's workload capacities.

Accrual basis accounting

Biigtigong uses accrual basis accounting methods. Under the accrual basis, revenues and expenses are recorded when they are earned, regardless of when the money is actually received or paid. Accrual basis provides a more realistic idea of income and expenses during a period of time. This method requires a careful monitoring of cash flow.

Generally Accepted Accounting Principles (GAAP)

Biigtigong complies with the Generally Accepted Accounting Principles. GAAP is a collection of commonly followed accounting rules and standards for financial reporting. GAAP compliance makes the financial reporting process transparent and standardizes assumptions, terminology, definitions and methods. The purpose of GAAP is to ensure financial reporting is transparent and consistent from one organization to another.

Financial Reporting

We adhere to a regular internal reporting system to ensure we are meeting our financial goals and objectives. Program Directors follow a strict regiment to review financial reports monthly and complete a series of financial tasks. Central to effective decision-making and having the ability to take corrective actions is having access to accurate and timely financial data.

Financial reporting requirements stem from a variety of sources, and financial reports serve many purposes. For example, they serve as tools for use by managers to control their departments and to monitor the extent to which management's objectives are being achieved. They also provide information to external parties on an organization's financial operations and compliance with a variety of requirements. Our Smart Cities management team will adhere to the reporting requirements as defined by Biigtigong and our funding

agencies. We will ensure stakeholders have access to timely and accurate reports to allow for good decision making.

For the purpose of our proposal, our reporting system will have to be customized to accommodate the meeting of milestones, as per the contribution agreement. The SC Executive Board will provide regular written reports to the Director of Finance regarding the status of achieving the milestones. These reports will be developed based on the performance reports received from the project implementation staff. These reports will provide the necessary information needed to be the reporting requirements of Infrastructure Canada.

Human Resource Management

Human resource management is a critical success factor for the First Nation and it directly determines the business outputs. Human resource development and management play an important role in the overall financial management of our operations. We aim to maximize employee performance and create a supportive organizational culture to facilitate this.

Human Resource Planning

Through effective job analysis and design, we created positions with job descriptions and specifications to meet the needs of the organization and project implementation. The following chart summarizes our human resource requirements to implement our Smart Cities proposal. The majority of the budget will be allocated to human resources, making human resource management especially important to our financial management plan.

Human Resource Requirements – Smart Cities Proposal					
Position	Reporting to	Status	Time Period	Salary Grid Classification	Salary Range
Governance					
Proposal Lead	Executive Board	½ time	5 year	SM2	84,864-95,472
Project Coordinator	Proposal Lead	Full time	5 year	PS3	41,457 -54,092
STEM Implementation					
SC Education Lead	Education Director	Full time	5 year	T2.2	55,500 -81,600
CompTIA A+ Lead	SC Education Lead	Full time	5 year	T2.2	55,500 -81,600
Co-op & Business Coordinator	Economic Development Manager	Full time	5 year	PS3	41,457 -54,092
reBOOT Coordinator	Economic Development Manager	Full time	5 year	EA2	29,766 -38,839
WaaWaa Immersion Video Production					
Immersion Lead	SC Education Lead	Full time	5 year	T2.2	55,500 -81,600
WaaWaa Instructor	Immersion Lead	2 -½ time	5 year	ECE2.2	37,756-49,263
Nishnaabemwin					
Audio Overdub	Proposal Lead	Full time	5 year	Contract	85,000
Bilingual STEM	Proposal Lead	Part time	5 year	Contract	12,500 – 55,000
Meet-up Function					
Meet-up Coordinator	SC Education Lead	Full time	5 year	PS1	37,669-49,149
Technology					
BiigtigongX Administration	Project Coordinator	Part time	5 year	Monthly contract	1,200
Database Administration	Project Coordinator	Part time	5 year	Monthly contract	500

Human Resource Management Tools

Biigtigong uses the following tools to assist in our efforts to maximize employee performance and meet our operational goals and outcomes:

1. Hiring Policies: Provides process to hire, interview, recruit, and determine if you will need to implement training or development for potential or current employees.
2. Termination Policies: Provides process to deal with termination or voluntary resignations.
3. Job Descriptions: Establish clear roles and responsibilities and qualifications.
4. Employee Performance reviews: Provides mechanisms to conduct performance reviews and evaluations of staff.
5. Employee Handbook: Provides a snapshot of our policy guide.
6. Health and Safety Policy: Provides health and safety standards and procedures.
7. Discrimination/Sexual Harassment Policies: Process on how complaints and investigations will be handled.

8. Detailed Policies: Regulations regarding benefits, such as, vacation, holiday, personal, and sick pay, company benefits, salaries, etc.
9. Required Policies: Required policies are anything that the federal, provincial or local governments require (WSIB, EI, CPP).
10. Specific Policies: Confidentiality Policy, Social Media Policy, Cultural Leave Policy.

The Budget Process

The budget process is one of the most important components of successful financial management. The budget process extends beyond the preparation of a document that appropriates funds. Budgeting is strategic in nature, encompassing multi-year financial and operating plans that allocate resources on the basis of identified goals. It serves as the performance benchmark for all financial decisions. A budget ensures that an organization can fund its commitments, meet its financial and program objectives and control spending. It allows for measurement of performance and the identification of potential problems. The budget is the overall financial framework.

The development of Biigtigong's Smart Cities budget was done in accordance with the budget policies of the First Nation. The budget was also developed in consideration of the expectations as identified in the Smart Cities Finalist Guide. Our budget supports the implementation of our proposal and the achievement of our goals.

Biigtigong's Annual Planning and Budgeting Schedule

Task	Individual Responsible	Timeline
Annual planning kickoff meeting to present major budget policies, multi-year financial plan direction and guidelines for the strategic plan.	Director of Finance, Senior Management Team, Finance & Audit Committee	3rd week in November
Update Tangible Capital Assets.	Senior Management, Director of Finance	1st week in December
Each Department prepares a thorough analysis & projection of all expenses for the budget yr.	Senior Management Team	2nd week in January
Consolidate all draft budgets including capital budget into one master budget;	Director of Finance	4th week in January
Multi-year plan and strategic plan developed or updated.	Senior Management, Director of Finance	1st week in February
Senior management reviews draft budgets, multi-year plan, and strategic plan.	Senior Management, Director of Finance	2nd week in February
Present budget, multi-year plan, and strategic plan to Finance & Audit Committee for review, discussion, and modification.	Director of Finance, Senior Management Team, Finance & Audit Committee	3rd week in February
Incorporate Finance & Audit Committee changes to any of Planning Documents	Director of Finance, Senior Management Team, Finance & Audit Committee	1st week in March
Inform the membership or involve the membership in consideration of the annual budget and the multi-year financial plan.	Director of Finance, Senior Management Team, Finance & Audit Committee, Council	3rd week in December
Council reviews & approves budget/multi-year plan/strategic plan based on recommendation from the Finance and Audit Committee.	Council, Finance & Audit Committee	3rd week in March
Distribute approved budget and strategic plan to Department Heads and any other appropriate staff and community.	Director of Finance	3rd week in April
Inform membership of approved budgets.	Director of Finance, Senior Management Team, Finance & Audit Committee, Council	3rd week in May
On going monitoring, reporting and reviews.	Director of Finance, Senior Management Team, Finance & Audit Committee, Council	Throughout the year

Major Budget Considerations

Strategic Plan Integrations

An effective financial management system needs to support the organization's strategic plan and vice versa. It is part of a network of systems bound together to provide high-level services to our membership in order to meet their needs. Sound financial management is critical to the success of long term strategic planning and short term operational planning. Biigtigong has well-established strategic planning processes. Financial management and budgeting systems are designed to facilitate project implementation.

Human Resource Requirements

Once the human resource needs were identified and job specifications determined, the positions were reviewed in relation to our salary grid and policy. The review was to ensure positions are properly categorized according to the criteria established in the policy. Each new staffing position resulting from the Smart Cities proposal has been categorized and is subject to the

salary range provided within the grid. Estimates for mandatory employer related costs were incorporated into the budgets.

Contracts will be awarded for the Nishnaabemwin audio overdub work. This will be done in accordance to Biigtigong's procurement policies. The following charts summarize the range of production times to produce one hour of video. We conducted some WaaWaa pilots tests and our results varied due to the individual making the video, the content of the video, familiarity of the content, video recording, prop preparation and location. These variables have been considered in our estimations of producing WaaWaa video and overdubbed WaaWaa video. We assume that we will produce video quicker once we have a workflow and some experience in production. We have identified mitigation strategies to address the risks associated with video production.

NISHNAABEMWIN AUDIO OVERDUB PRODUCTION TIME ESTIMATIONS					
Hours of video to be produced each year	**100 Year 1**	**350 Year 2**	**450 Year 3**	**550 Year 4**	**550 Year 5**
Ratio 6:1 (hours)	600	2,100	2,600	3,109	3,100
Ratio 5:1 (hours)	500	1,750	2,250	2,750	2,750
Ratio 4:1 (hours)	400	1,400	1,800	2,200	2,200
Ratio 3:1 (hours)	300	1,050	1,350	1,650	1,650

Salary Range: $85,000

WAAWAA IMMERSION VIDEO PRODUCTION TIME ESTIMATIONS					
Hours of video to be produced each year	**200 Year 1**	**400 Year 2**	**400 Year 3**	**500 Year 4**	**500 Year 5**
Ratio 6:1 (hours)	1,200	2,400	2,400	3,000	3,000
Ratio 5:1 (hours)	1,000	2,000	2,000	2,500	2,500
Ratio 4:1 (hours)	800	1,600	1,600	2,000	2,000
Ratio 3:1 (hours)	600	1,200	1,200	1,500	1,500

Salary Range: $37,756 - $49,263

BILINGUAL STEM VIDEO PRODUCTION TIME ESTIMATIONS					
Hours of video to be produced each year	**50 Year 1**	**175 Year 2**	**225 Year 3**	**275 Year 4**	**275 Year 5**
Ratio 5:1 (hours)	250	875	1,125	1,375	1,375
Ratio 4:1 (hours)	200	700	900	1,100	1,100
Ratio 3:1 (hours)	150	525	675	825	825
Ratio 2:1 (hours)	100	350	450	550	550

In our pilot video production exercises various problems arose that were immediately mitigated on the spot. Our goal is to make high quality understandable immersion video. However, we need to do this within a reasonable amount of time and efficiently. We implemented some different strategies and found improvements in production time. We will have to closely monitor the production of video and continuously look for ways to better streamline the production. Our project based accounting software will assist us in tracking hours of production and providing us with more accurate

numbers to make decisions.

Board and Committee Costs

Expenses related to the operations of our two committees and the Executive Board has been incorporated into the budget. Expense categories included honorarium, travel and training, in accordance to Biigtigong's policy and the scheduled meeting and/or training times.

Technology Costs

Expenses related to the administration and management of BiigtigongX, our on-line platform, including the costs of Appsembler and the database has been included in the proposal. We carefully examined the option to utilize Appsembler as our main administrator versus hiring a full time person. The decision was made to use Appsembler due to lack of qualified resources in the community and the pricing was cheaper than hiring a full time staff. Expenses for some education licenses, supplies and equipment are included.

Training

Annual training dollars has been allocated to each year. Training and capacity building at the local level is of primary importance. Building internal capacity for the purpose of long-term sustainability is always one of our ways to achieve our goals. Our training will be very specific to the needs of the projects. We will implement a training video series, which demonstrates our experience and best-practices from implementation.

Community Engagement Costs

We included a budget for the community engagement expenses. Part of these expenses includes for some meetings off reserve. Engagement activities will support the implementation of our engagement strategy, as outlined in Chapter 6.

Revenue

Biigtigong has committed $100,000 a year to support the language revitalization efforts. We have not identified any other revenue sources, other than Infrastructure Canada. We are committed to looking for additional sources of revenue, should our proposal be selected. Although revenue is not

being transferred directly to the Smart Cities accounts, other organization Departments are making contributions to the project implementation. These contributions are listed further down in this chapter.

Budget and Project Milestones

Our budget was developed to facilitate the implementation of our proposal and the attainment of our outcomes. An accompanying detailed listing of milestones that will trigger payments supports the budget. The milestones are broken down according to fiscal quarters per fiscal year. Further details regarding the milestones and the specific outcomes and indicators are discussed in Chapter 2. We feel the milestones identified are measurable and achievable and provide a sound basis to determine the release of payments. We will continually monitor and evaluate our entire process and making the necessary adjustments to ensure we are meeting the goals of our project. As part of our commitment to transparency and accountability, we will keep all of our stakeholders aware of our progress in attaining our outcomes and celebrating our milestones. It is our intention to ensure our community celebrates the achievement of our milestones; these celebrations are important, especially in the beginning of new projects that are not traditional in nature.

Cash flow and Project Milestones

We developed cash flow statements based on the budget and the project needs. Our expenditures are posted to specific periods that correspond with the actual project activities. Our revenue streams, at this time, only have two sources – Biigtigong Chief and Council ($100,000 annually) and Infrastructure Canada (1 million annually). We propose an initial $250,000 from Infrastructure Canada be released in July, another $500,000 in December and the remaining $250,000 in April. These release periods are supported by the identification of specific milestones.

Our cash flow projections indicate a few months where there is a negative net cash flow from operating activities. The negative cash flow resulting from the proposed cash release periods has been carefully examined in relation to the cash flow requirements of the entire organization. These numbers have been amalgamated into the organization’s combined budget. Our Director of Finance and the Finance Committee make decisions regarding the cash

needs of the organization. The negative net cash flow resulting from this project is not a problem in the bigger management of our cash flow requirements. As our milestones are identified by fiscal quarters, we are flexible in determining the actual cash release dates. However, we believe we can manage our affairs with the cash flow projections provided herein.

Monitoring and Controlling the Budget

All departments are required to regularly monitor actual activity to planned activity and control their expenditure to ensure that it is in line with available funds. If required, appropriate corrective action should be taken to resolve significant differences between actual and planned activity. Our finance policy and procedures outline the required steps to monitor and control the budget. The Program Lead will be responsible for the monitoring and controlling of the budget. Regular reporting to the SC Executive Board will ensure accountability, along with reporting to Chief and Council.

Measuring Performance and Outcomes

Budgeting supports the implementation and achievement of project outcomes and goals. Chapter 2 of our proposal outlines our approach to performance measurement. It is important that our outcomes are clearly stated and that the indictors accurately measure our outcomes. Clear communication and reporting systems between the SC Project Lead, the implementation teams and the Finance Department are important to the overall management of the program.

Community Engagement

We will adhere to the reporting requirements set out by Chief and Council and the Senior Management Team as per the policies of the First Nation. However, we are committed to enhance the level of engagement for this proposal and are implementing a new (but ancient) method of engagement – our traditional clan system. We are going to use this more intimate relationship based method to engage our membership. We will utilize this system to provide financial and performance information to our membership. Since this is a new initiative, we will be implementing systems to track, evaluate and adjust the process immediately, as part of its development process. We are trying to find creative approaches to providing our citizens

the opportunities to increase their knowledge and become active players in building their families, community, Nation and the world.

Contributions

Our approach to amplifying the impact and reach of our Smart Cities proposal is ensuring there exists alignment with the overall vision and goals of the First Nation. Our strategy is not necessarily geared at leveraging revenues but rather developing and adjusting our programs to ensure long-term sustainability of our Smart Cities projects. The five year implementation period will allow us to develop resources, capacity and systems that will be integrated into the regular programs be provide.

Annual Funding:

$100,000 is currently allocated to the language revitalization via a ten-year commitment made by Chief and Council. This funding will be directly transferred to the Smart Cities account to assist with the language efforts.

Program Support:

Departments within our organization have directed resources within their respective departments to support of the Smart Cities proposal. These resources will remain in the existing structure and management systems of the First Nation. However, they have been assigned to assist in the implementation of the Smart Cities proposal. We have a culture and the systems to support inter-departmental collaboration on shared vision, shared problems and shared approaches. These contributions amplify the impact and reach of our projects.

Department	Contribution	Purpose
Child & Family Learning Centre	1 FT Staff Position, salary and MERC	Language Revitalization
Child & Family Learning Centre	STEM based professional development for ECE teachers	STEM Implementation
Health & Social Services	Inter-generational trauma support and recovery services	Language Revitalization
Health & Social Services	Bilingual Health Promotions & Signage	Language Revitalization
Sustainable Development	Nishnaabe place-name reclamation project	Language Revitalization
Sustainable Development	Local Oral History Project	Aadsookaanan and language immersion stories
Sustainable Development	Supervision & management by the Economic Development Manager	High School reBOOT and CompTIA A+ Co-op program implementation
Sustainable Development	Summer Student Supervisor	High School summer student reBOOT and CompTIA A+ program
Sustainable Development	Summer Student Employment Positions for CompTIA A+ and reBOOT support	High School summer student reBOOT and CompTIA A+ program
Education	1 FT Staff Position, salary and MERC	Language Revitalization
Education	Education staff will be implementing the K-12 STEM and Nishnaabemwin Immersion	K-12 STEM Bilingual STEM video Nishnaabemwin Immersion
Education	Professional Development geared to support STEM, Blended Learning and Growth Mind Set	K-12 STEM Nishnaabemwin Immersion
Education	Coordination of Land-based learning activities & the Meet up program	Meet-up app Real-world connections
Education	Student program equipment & supplies	K-12 STEM
Education	Summer Student Coding Camp & Co-op Prerequisite delivery	K-12 STEM
All Departments	CompTIA & reBOOT co-op placement and summer student employment support	K-12 STEM
Other – Related Entities		
Pic River Development Corporation	$20,000 Computer Donation to the school (possible annual donation) IT Support, cloud file transfer	K-12 STEM
Anishinabek Employment & Training	Summer Student Employment and Training Contribution - $50,000 for 3 years. Access to other services via proposal	High School summer student reBOOT and CompTIA A+ program

Report on the use of the Finalist Grant

We identified a series of priority tasks that were required in order to further develop our final proposal. The finalist grant was used to complete these tasks. The following provides a summary of these tasks.

1. **Develop an On-line Education Model**: Our team conducted extensive research on on-line education models. Based on our research and an examination of our student needs, consideration of our resources and review of our education philosophy, we determined that a blended-learning model was most appropriate for us. Blended-learning is an approach to learning that combines face-to-face and online learning experiences. The combination of the in-person and online elements create a richer learning experience. We are not creating an on-line education model, but rather a hybrid model, that makes the best of on-line and the brick and mortar model.

   We also examined various education pedagogies relating to on-line education. We adopted the Growth Mindset approach, a learning theory developed by Dr. Carol Dweck. It revolves around the belief that you can improve intelligence, ability and performance, as the mindset is malleable. Unlike a fixed mindset, where the belief is that they are either 'smart' or 'dumb', the Growth Mindset advocates that abilities can be developed.

   Additionally, we reviewed the Blended Learning approach to education and the Growth Mindset philosophy in relation to our traditional Nishnaabe practices relating to learning. We believe that the three approaches can work collectively to provide the best learning experience for our children and families. Some initial training with our education staff was conducted and they were involved in the decision-making process regarding the approaches and methods of learning to be implemented in this project. The community was engaged in discussions and presentations on the Growth Mindset and blended-learning approaches to learning.

2. **Research eLearning, eAcquisition and meetup open source platforms/applications**: Based on our identified needs and the consideration to make our project scalable and replicable, we selected Open edX, a Learning Management System. Our platform to house the eLearning, eAcquisition and the meetup forum will be called BiigtigongX.

3. **STEM Curriculum Development**: We employed our teaching staff and experts in the STEM field to design and develop K-12 STEM curriculum. Our current leads in our math and science programs conducted a mapping

exercise, looking at how the on-line curriculum as presented by Khan Academy matches with the Ontario Provincial Curriculum. We developed a strategy on how to augment and enhance our current math and science programs with on-line resources.

After extensive research across many sectors, consideration of needs and the availability of resources, we determined a pathway to allow us to meet our needs. We identified the skills, knowledge and abilities we wanted to develop in our students and then determined the resources that we would employ to facilitate this learning. Our technology and engineering components of our proposal will utilize a variety of on-line resources with classroom teacher support; this is laid out in Chapters 1 and 2. Assessment and evaluation processes to measure student success are included in the curriculum.

4. **Reconstruction of Core Aadsookaanan**: Much of the work during the finalist stage was identifying the risks associated with putting our aadsookaanan on-line and the potential disconnect from the real world. Time with our elders and knowledge holders helped develop a model that mitigates any potential risks and embraces the possibilities of cultural revitalization of our sacred stories in this modern time. Additionally, our initial research provided evidence that their exists significant amount of primary research from the community that would facilitate legitimacy in our reconstruction work. A draft framework and work plan has been developed.

5. **Language Immersion Video Development**: Our immersion model is based on research and best practices in the creation of speakers. In addition to the research, we have been fortunate to witness this model being successful with an individual, who happens to be now working on our language revitalization plan. We spent time with potential immersion instructors providing them with the knowledge and tools to make immersion video. Our training produced three amazing WaaWaa Immersion Instructors. These immersion instructors produced a variety of videos, which were tested internally for understandability and for teaching purposes. We have a team of trained WaaWaa instructors who are ready to produce highly comprehensible immersion video.

We also showcased four videos at a community night to demonstrate our immersion video. We purposely selected videos that we thought would bring laughter to our audience; we wanted a roll out that brought laughter and hope. These videos were successful in demonstrating our product. The audiences that viewed our video reported that they understood the story and its meaning was successfully conveyed. This provided additional verification that our model will work; we still have to take a few moments to breathe, as we will be creating generations of understanders of our language, something that has not been done in a long time. It truly is empowering.

We spent some time looking at the world of animation, specifically 2D animation. Utilizing this option comes with a huge learning curve; however, we want to continue exploring the option and determine its feasibility.

6. **Language Audio Overdubs on STEM Material**: Our consultations with our elders and individuals knowledgeable in STEM, has provided good direction in our efforts to produce bilingual STEM video. We discussed ways to integrate STEM, our Aadsookaanan, the meanings within our language and our traditional knowledge. This video will not be immersion video. However, the material will be accessible in English to be utilized by today's students. This video will also assist in helping raise the language proficiency of our community's understanders and speakers of our language.

7. **Data Collection**: Considerable time was spent determining what data was actually needed to support the measurement of our outcomes. Our education system already has a process for the collection, protection and distribution of student data. We will continue to protect the data of our children and have the school be the central entity for the student data.

8. **Community Education and Engagement**: Engaging the community on this initiative was a wonderful community building experience. It was exciting and everyone was engaged, a bit fearful of change but willing to embrace change for the betterment of our children. Part of meaningful engagement is providing education and facilitating a learning experience.

Our community members have a basic knowledge base of things like, second language acquisition, blended learning, growth mind set, programming languages, technology and engineering. With education comes meaningful engagement and support.

We conducted community wide and focus group surveys and lots of engagement activities. We had support during our application process but we have gained so much more than support during this phase. Our community, our staff and our leadership see the absolute importance of our proposal. We have real community buy-in; they are engaged partners.

9. **Elder and Knowledge Carrier Protocols**: We respected the cultural protocols in place for our time with our elders and knowledge carriers. Teachings were shared regarding cultural protocols regarding the transfer of knowledge and the social environment in which these may occur. Discussions occurred over the impacts, both positive and negative, of the digital world and the transfer of our cultural knowledge. A solid relationship has been built with our elders and knowledge keepers. Their involvement remains critical to the success of our project.

10. **Project Management Software and Collaboration Tools**: We utilized Slack for our collaboration work. Project management software was not looked into, as there already exists effective in-house systems of management.

11. **Training/Travel**: We conducted a training needs assessment to determine the gaps regarding the delivery of the new services being proposed. Some initial training was provided to our classroom teaching staff, along with pilot projects that implemented the teaching of technology and engineering. Training was also provided to other staff members connected to the project implementation. We conducted immersion education training for our WaaWaa instructors. Ongoing training will be built into the proposal in order to build the capacity at the community level to ensure long-term sustainability.

12. **Governance and Administration**: A staff member was assigned to coordinate the project. Governance and administrative systems to effectively and efficiently support the project are set up. We built upon the existing structures and policies of the First Nation while creating some innovative approaches to governance. Our clan system of governance will be used for engagement and consultation with the community. Some financial resources were spent on software, hardware and other supplies. Detailed financial analysis of the project was completed.

13. **How-to-Manuals**: Our education staff will be documenting some best practices as a result of project implementation. The staff acknowledged their fears in teaching subject matters where they had limited knowledge and skills. In response to this fear, they decided to document their journey and provide encouragement and tips for others facing similar challenges.

Summary of Expenditures via Projects

Project	GL Accounts	Amount (Nearest $100)
On-line education model	63900-136	9,300
eLearning, eAcquisition and Meet-Up Platform	61110-136	6,500
STEM Curriculum Development How-to-manuals	61000-136 69010-136 68500-136 68200-136	29,200
Aadsookaanan Reconstruction	61110-136	5,000
WaaWaa Immersion Video	61000-136 64410-136	5,300 12,000
Audio Overdubs on STEM Material	61110-136	10,700
Nishnaabemwin	63900-136	10,200
Data Collection	63900-136	
Community education and engagement Elder and Knowledge Carrier protocols	60900-136 61900-136 62300-136 60900-136	300 20,300 3,100
Collaboration Tools	62630-136 63700-136	700 100
Travel/Training	66350-136 66620-136 66630-136 66634-136 66700-136 67300-136 67400-136 67410-136 67430-136	37,200
Governance and Administration	69010-136	40,000
Supplies & Equipment	65400-136 64030-136 65450-136	2,500 3,300 900
Coordination & Development	61000-136 69010-136	20,000
Proposal	61000 -136	10,000
Sub-total		226,600
Administration Fee	8%	20,000
Total		246,600

Financial Risks and Mitigation Strategies

Our approach to risk management is identified in Chapter 3. Risk management is an on-going task and is not something that happens at a particular time in the project's lifecycle. We have carefully examined a comprehensive list of risks throughout the development of this proposal. We have successfully mitigated and/or avoided some potentially significant risks. In our belief, this has led to a much better and more realistically implementable project. We continue to be aware of the likelihood and potential impacts of the risks in front of us. We will respond accordingly.

The biggest risk of all is the loss of Nishnaabemwin – not only from the hearts and spirit of our children, our families, our communities and Nations, but from the world. Once the Nishnaabe language is lost from here, it is lost forever. Immersion is the mitigating action towards the loss of Nishnaabemwin in Biigtigong. We have done considerable research in how to create speakers and immersion is our answer. We have also been fortunate to witness first hand the results of this method. We saw a young man, who was adopted out and never raised in his community, with his family, with his people, with his culture, his language, find his way home – researched and taught a first speaker how to pass on her language and today he is a fluent speaker of Nishnaabemwin. This is the method that we will use to make our video. It's amazing to think that our language can once again be passed on in our homes, our schools – actually, pretty much anywhere. It's just going to be done in another way because of the emergency state of our language.

Financial Risks and Mitigation Strategies			
Risk	**Likelihood**	**Impact**	**Risk Management Approach/Mitigating Actions**
Cost to make WaaWaa Immersion Video is too high	Medium	High	• Provide on-going training • On-going Immersion Instructor Recruitment • Establish work flow procedures and accountabilities • Set up a review & monitoring system • Establish best-practices • Provide stories and video content ideas • Provide employee support and encouragement
Nishnaabemwin audio overdub cost is too high	Medium	High	• Audio-video editing software & related training • Establish work flow procedures and accountabilities • Set up a review & monitoring system • Establish best-practices • Consider use of a first speaker as a consultant • Research animation and other technological options • Focus priorities and on core competencies
Extreme high cost of uploading and downloading video	High	High	• ISP (PRDC) is providing free on-site services to assist in the offloading, downloading and uploading of video
Expensive video backup system; cloud service unreliable for now	Medium	High	• Develop safe and reasonably costed manual backup system • ISP (PRDC) is setting up a free back up system on their servers
Loss of $100,000 financial contribution from Chief & Council	Low	Medium	• Examine projects and make adjustments (cuts) where necessary • Ensure efficiency and effectiveness of projects • Provide and show value for the $100,000 donation – produce results • Apply for other funding and financial contributions
Project variances – deficits/cost-over runs	Low	High	• Good financial planning (strategy, budgets, short and long term) • Measurable outcomes • Regular monitoring and reporting and adjustments • Follow Biigtigong's Finance Policy and Procedures (everything is addressed in detail) • Executive Board involvement
Delay on completion milestones dates	Low	Medium	• Good planning – measurable and attainable • Utilize project function options on accounting software • Sound management and supervision processes • Implement on-going evaluation and corrective measures process • Communication – Executive Board, Director of Finance
Cash Flow challenges	Low	Medium	• Good planning – measurable outcomes, milestones and results • Good management and supervision processes to meet outcomes • Provide accurate and timely information to Director of Finance • Ensure reporting requirements are followed • Follow Biigtigong's Finance Policies and Procedures
Partnerships are costly	Low	High	• Build internal capacity and take on responsibility at the community level • No long-term financial dependency on partners • Financially creative – no duplicate of services, efficiencies, mutually beneficial

			• Develop detailed agreements, if necessary
Low Student Participation	Medium	Medium	• Program is designed to be interactive and hands on approach • Meaningful outcomes • Onboarding and recruiting strategies • Incentives – i.e. Summer Student Employment • Community celebrations • Good co-op placements • Offer program neighboring First Nation • Develop on-line resources for scalable and replicable
Miscommunication between departments that are working on projects.	Low	Medium	• Written communication and protocols • Utilize real time collaboration tools • Regular meetings – with set agendas • Dispute resolution process • Clear roles and responsibilities
Inaccurate or incomplete project results due to the failure to identify and/or document specific project activities.	Low	Medium	• Clear performance measurements to be set • Determine indicators and measurement tools • Set deadlines and standards • Set up deadlines and activities inside of accounting software • Reporting standards • Performance standards for employees
Uneven workflow issues that decrease employee productivity	Low	High	• Accurate and thorough job analysis process • On-going monitoring and evaluation • Utilize iterative management approaches • Develop good relationships – open communication • Promote organizational culture

Operating Budgets and Cashflows

The five (5) Year Operating Budget and five (5) Year Cashflows are presented on the subsequent pages. Cf PDF file in the folder.

Chapter 9 – Implementation phase requirements

This chapter requires you to identify and provide the plans for meeting applicable municipal, provincial, and federal reporting and legislative and policy requirements, should you be selected as a winner.

These requirements are:

- ***Duty to Consult with Indigenous groups**: The common law duty to consult is based on judicial interpretation of the obligations of the Crown (federal, provincial and territorial governments) in relation to potential or established Aboriginal or Treaty rights of the Indigenous peoples of Canada, recognized and affirmed in section 35 of the Constitution Act, 1982 . In Canada, the duty to consult with and accommodate with Indigenous peoples arises when the Crown contemplates actions or decisions that may affect an Indigenous person's Aboriginal or Treaty rights. The Duty to Consult is a constitutional duty that invokes the Honour of the Crown and it must be met. The duty is triggered at a low threshold: all that is required is contemplated Crown conduct resulting in a potential adverse impact to a credible claim. In addition to fulfilling legal obligations to engage with modern treaty holders and self-governing Indigenous groups, finalists may also consult on the basis of the Duty to Consult or as a good governance practice.*
- ***Modern Treaty Obligations**: Modern Treaties (also called Land Claim Agreements) are a key component of Canadian nation-building. They advance the shared objective of reconciliation, promote strong and sustainable Indigenous communities, and advance national socio-economic objectives, to the benefit of all Canadians. Treaties are legally binding and constitutionally protected agreements that set out specific rights, benefits and obligations for the signatories. Treaty provisions will vary from treaty to treaty. Treaties and treaty rights also vary depending on the time and circumstances in which they were negotiated.*
- ***Community Employment Benefit (CEB)**: The Investing in Canada plan (under which the Challenge is funded) encourages project planners and communities across the country to take advantage of their infrastructure projects to support the diversification of recruitment, training, and procurement practices. Identify your plan to target and report upon CEB requirements, should you become a winner. The CEB can also be linked to your diversity and inclusion considerations given that many of the targeted groups overlap. Winners will need to identify employment and/or procurement opportunities for at least three of the following groups:*

apprentices; Indigenous peoples; women; persons with disabilities; veterans; youth; recent immigrants; and small, medium, and social enterprises. CEB guidance can be found here.

- ***Climate Lens Assessment (CLA)**: The CLA has been designed as a framework for assessment and reporting for any projects that either (1) deal directly with greenhouse gas mitigation or climate change adaptation, or (2) are funded by the program in the amount of $10 million or above. The Investing in Canada plan (under which the Challenge is funded) encourages planners to consider the climate impacts of any project funded under the program. The Climate Lens Assessment (CLA) is intended to provide meaningful insight into the climate impacts of individual projects, and encourage improved choices by project planners consistent with shared federal, provincial, and territorial objectives articulated in the Pan-Canadian Framework for Clean Growth and Climate Change, including a commitment to reduce Canada's greenhouse gas (GHG) emissions by 30% below 2005 levels by 2030. CLA guidance can be found here.*
- ***Other applicable laws and regulations and policies,** including any cases of change or exemption to legislation and regulations that may apply to projects*

Evaluation criteria

- *Plans for meeting relevant municipal, provincial, and federal reporting and legislative requirements are provided and serve as sufficient groundwork for the implementation phase should the finalist be selected as a winner*
- *Risk strategy is thorough and adequately addresses key risks*

Chapter 9 – Implementation phase requirements

Introduction

Biigtigong Nishnaabeg is committed to meeting the applicable municipal, provincial and federal reporting and legislative and policy requirements should we be selected as a winner.

Duty to Consult with Indigenous Groups

Biigtigong Nishnaabeg is a First Nation community and therefor the Duty to consult with indigenous groups does not apply. However, with that being said, we want to acknowledge that Biigtigong Nishnaabeg has policy regarding Duty to consult. This document outlines how Biigtigong Nishnaabeg expects to be approached regarding activities within their traditional territory. This guideline establishes Biigtigong's expectations, policies and practices for governments and others to follow when consulting with them. Our Smart Cities Team reviewed this policy as we were developing our engagement strategy with the community. We wanted to build upon best practices established in the community and develop a solid engagement strategy.

Modern Treaty Obligations

With the exception of six First Nations, Biigtigong being one, the area First Nations are signatories to the Robinson-Superior Treaty of 1850. There are no modern treaties in the Biigtigong Nishnaabeg traditional territory or shared territory with surrounding First Nations.

Canada's Community Employment Benefit (CEB)

Projects supported by the Investing in Canada Infrastructure Program provide an opportunity to promote increased employment opportunities for a broader array of Canadians. The Smart Cities Challenge requires the finalist to identify employment and/or procurement opportunities for at least three of the

targeted groups and how Biigtigong intends to report upon CEB requirements, should we become a winner.

To meet these requirements Biigtigong has selected the following 3 target groups: Indigenous peoples, woman and youth. The main beneficiary of our Smart Cities proposal is Canada's Indigenous youth. Our projects are specifically aimed at this group with the ultimate goal of making them more educated and more employable. We will include woman as a specific category that we will also target. We will ensure our indicators for success specifically capture data on these 3 identified groups, in terms of their participation in our projects. We anticipate that 90% of our participants will come from one of these groups.

Additionally, we will utilize our procurement strategies and direct our hiring towards these 3 groups. We expect that at least 80% of our work force for this project will be Indigenous, a youth or a woman. It will be very easy to meet these targets and to track the relevant supporting data.

Reporting on the CEB Requirements

As per the CEB requirements, we will report annually on the progress made. Should we be selected as a winner, we will develop a detailed strategy that also defines our reporting requirements. CEB requires some specific information and we will accommodate this requirement. For example, we need to track the number of hours worked by the target population and/or the value of contracts awarded to the target groups. Our accounting software allows us to easily track this information.

A qualitative narrative that describes the progress made is also required. The narrative will provide information on both the successes and challenges experienced in meeting our targets. We understand Biigtigong Nishnaabeg – Smart Cities Final Proposal Page 130 of 131 that this information will help in developing Canada's strategies to offer more diversified employment and procurement opportunities.

We will develop specific reporting mechanisms to support any requirements or conditions of being a selected a winner. We have experience establishing

targets, monitoring progress and being flexible to respond to issues.

Risks and Mitigating Strategies

Risk	Likelihood	Impact	Mitigating Strategies
Woman at home with no child care	Medium	Medium	• Provide childcare support at the daycare • Work with other supports in the community
Work readiness levels are low amongst participants	Medium	Medium	• Community programs exist that provide assistance in this area – use these • Long-term strategies
Youth experiencing social and emotional issues	High	High	• Social Service support programs • Cultural support programs • Life skills component built in • Use of elders in the programs • Utilizing land-based learning program
Lack of parent support	Low	Medium	• Provide information and education to the parent • Offer home-visits • Engaging and non-judgmental approaches • Utilize existing relationships
Lack of formal education and skill set to do some specific tasks	High	Low	• In the short-term we will have to recruit from outside the population • Develop long-term capacity development to attain education and experience
Current procurement policy may not support goals	Low	Low	• Review policy & recommend changes • Conduct education on updated policy
Political leadership lack of understanding of the project procurement goals	Low	Medium	• Address in person at a council meeting • Provide research and education • Regular reporting and communication
Lack of financial resources to implement training programs	Low	High	• Council has already made a commitment to direct some resources to summer employment • Develop funding proposals
Data security and protection of personal information	Low	High	• Data and Privacy Policy • PIA completion • Communications & education • Disclosure and Transparency strategy