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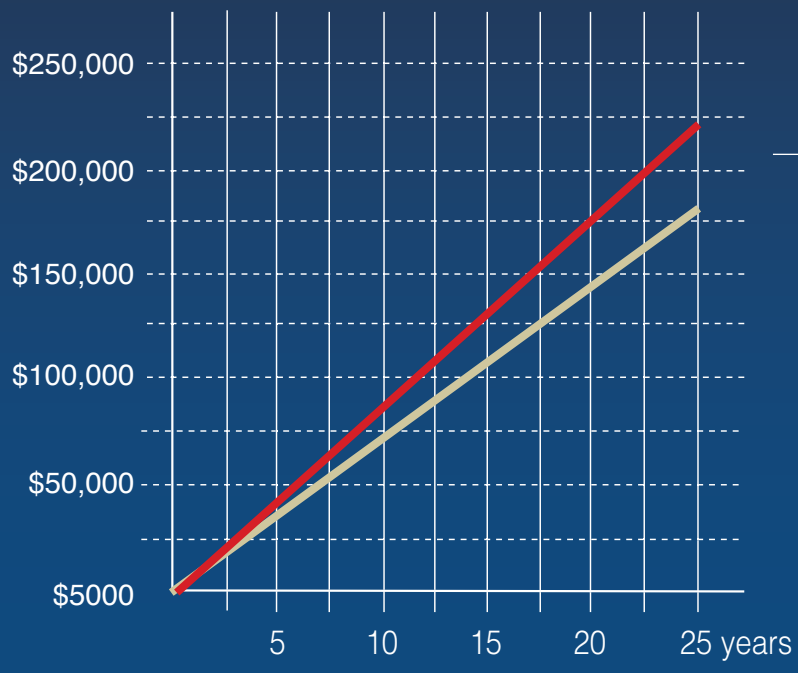

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Mario Scerbo, P.Eng.
President ACEC-MB

ACEC-MB Creating a Diversity and Inclusion Committee

ACEC Canada has recently undertaken a National Diversity and Inclusion Study and locally we are planning to start discussions on how best ACEC-MB can address and support this issue.

It is with great enthusiasm that I serve as ACEC-MB's President for the first year of my two-year term. I would like to start by giving my thanks to our outgoing president, Brad Cook, who has led us through the first global pandemic that we have all experienced. As I write this message, we continue be in uncertain times but collectively we are trending towards more "normal" times. Many of us are starting to work from the office again and are meeting face to face with our clients. I would like to also acknowledge everyone who has lost loved ones during this pandemic. My condolences to our colleagues at Manitoba Infrastructure who lost a great leader in Ruth Eden who was a friend and mentor to many in the industry.

Our executive board and our sub-committees have continued to meet on a regular basis to address issues that are relevant to our consulting industry. In all, we have 18 Committees and working groups, with over one hundred volunteers serving our collective interests.

I am pleased to report that we updated our fee guideline this year and it can be found on our website for

reference at *acec-mb.ca/about-us*. The guideline reminds us all that we should consider basing our professional rates on the value of services received by the Client. I would encourage all member firms to familiarize themselves with this document. I would like to let our great clients know that we take great pride in the quality and comprehensive services that we provide. This approach is consistent with our support of the Qualifications Based Selection (QBS) for the procurement of engineering services. I encourage everyone to read our QBS facts document that can be found on our website at *acec-mb.ca/about-us*.

The Limitations Act was proclaimed on October 27, 2021. The ACEC-MB Board has been participated on getting changes to the Limitations of Liability Act (newly named Limitations Act) for approximately 40 years. The limitations (i.e. the time period within which a person with a civil claim must start a court proceeding) in Manitoba has been reduced from 30 years to the basic limitation period of two years with an ultimate period of 15 years. The Limitations Act comes into force on September 30, 2022. I would like to personally thank all of those who preceded us for their collective efforts to get this law changed.

ACEC-MB is looking to address the important issue of Diversity and Inclusion by creating a committee. ACEC Canada has recently undertaken a National Diversity and Inclusion Study and locally we are planning to start discussions on how best ACEC-MB can address and support this issue. We recognize that many of our member firms are already dealing with this within their own businesses. I welcome any feedback on this. Please feel free to reach out to me or Kerri with suggestions.

I would like to personally thank the excellent executive board and all the volunteers that make up our association. I look forward to working with all of you over the next year.

Kerri Hiebert

New ways proving to be beneficial

Last year, I started off this message by saying, "what a year it has been", and I feel that holds true for this past year even more so. It has been another year of adapting and changing the ways the business of the Association can be done. In many circumstances the new ways have been very beneficial. Virtual meetings have provided one on one contact with Government officials and staff that weren't previously easy to meet with. Our members are reaping the benefit of more open conversations, quicker responses to requests, more transparency within government and the opportunity to get our message heard by more decision makers.

Virtual meetings have also given me the opportunity to attend ACEC-Canada Board Meetings and joint meetings with our Member Offices (MO's) across Canada. This has allowed for more information sharing, and more collaboration and learning between provinces. We know that each Province has different benefits and challenges within the Consulting Engineering world, and this open collaboration has been an asset to me, the Board and our membership in Manitoba, and has also given the other MO's insight into our many successes.

I am really looking forward to this upcoming year as we seem to be moving into some hybrid and/or in person events. Our first in person event was the 22nd Annual ACEC-MB Golf Tournament. Although the golf tournament was a bit smaller this year, we had the opportunity to hold the tournament in September on a warm, but vey windy day at a new course. Check out the pictures on pages 40 from Bridges Golf Course.

A lot of volunteer time and effort has also gone into fully upgrading the *acec-mb.ca* website. Technology moves along quickly and it was time for a refresh. The Image Committee took into consideration what changes would benefit our membership the most and have moved forward with an exciting update.

And finally, after approximately 40 years of discussing and providing updates and information on the Limitations Act (formerly Limitations of Actions Act) to our membership; it is time to celebrate the Limitations Act being passed into Law in Manitoba! ACEC-MB along with other likeminded associations worked long and hard to ensure the Limitations Act brought Manitoba fairly into alignment with other provinces. This relieves the stress and concerns the outdated Act caused our members. Please see page 30 for full information on the Limitations Act.

I am grateful to all of our Committee volunteers and the Board of Directors for all they do to make this Association what it is. I would like to personally thank Past President Brad Cook for his commitment and ability to lead the Association during these difficult times. And I welcome and look forward to working with new President Mario Scerbo as the Association continues to support our Member Firms. I look forward to seeing our members in person over the upcoming year and encourage all members to reach out to me at any time, in person, by email or telephone to bring up an issue, concern, question or to share success stories or information from your Firms.

Sincerely,
Kerri Hiebert
ACEC-MB Executive Director

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WAVERLEY UNDERPASS

PROJECT ENTRY PAPER
CLIENT NAME: CITY OF WINNIPEG (CITY)
FIRM: DILLON CONSULTING LIMITED (DILLON) & AECOM CANADA LTD. (AECOM)

INTRODUCTION AND OVERVIEW

Dillon Consulting Limited (Dillon) and AECOM were retained by the City of Winnipeg (City) to design and administer construction of the Waverley Street Underpass. The underpass replaced the former at-grade crossing of Waverley Street and the CNR Mainline (Rivers Subdivision Mile 3.89).

Due to rapid growth in the southwest quadrant of the City and increasing traffic congestion due to heavy train operations, upgrading the Waverley crossing of the CNR Mainline became a priority. With approximately 30,000 vehicles and between 35 and 40 train movements passing through the intersection daily, the Waverley rail crossing had become a major bottleneck and safety concern.

The project area included Waverley Street from Victor Lewis Drive to Grant Avenue, Taylor Avenue from Ash Street to Poseidon Bay, and Wilkes Avenue/Hurst Way from Sterling Lyon Parkway/Victor Lewis Drive to Parker Avenue.

In early 2014, the City of Winnipeg initiated a preliminary design study, retaining the Dillon/AECOM team. The preliminary design was concluded in early 2015, and detailed design occurred through 2016. Construction commenced in 2017 and ran continuously through 2019.

Substantial Performance of the main construction contract was achieved on time on November 1, 2019. Final landscaping and public art installation occurred in 2020.

The project team was tasked with developing more than just a grade separation of road and rail. The project also included:

- intersection and road improvements, including the twinning of Taylor Avenue;
- active transportation network enhancements;
- new land drainage sewer, watermains, and wastewater sewer to service the underpass and south River Heights;
- power, gas, communication, and lighting utility reconstruction;
- temporary rail and roadway detours to facilitate travel during construction; and
- landscaping and public art installation.

The project was a success. Not only was it completed on time, but it was also completed well under the forecasted budget of 155 million dollars established during preliminary design. Through the project process, including design refinements, favourable pricing, construction refinement, and risk mitigation, the current project forecast was lowered substantially to 88.1 million dollars.

The article herein presents features and attributes of the project by each of the technical disciplines. Each discipline contains achievements in engineering and geoscience. While presented separately below, the project was collaborative and overlapping, and the final product speaks to this achievement.

STAGING APPROACH

One of the major achievements of the project, is not any given technical achievement, but rather organizing all the pieces of the project together in the right order to ensure the project is completed on time and (under) budget. There were numerous pressures on the consulting team and the City while staging this project.

At the onset of the project, Dillon/AECOM evaluated the project size. Consideration of the volume of materials, manpower, and seasonal ability to construct had to be reviewed. It was determined that two construction contracts would be issued. Contract 1 would include work that could be advanced without a full project design, and could be used to procure specialized piping materials needed for Contract 2 that required long manufacturing lead times. Contract 1 works included a 1500 mm land drainage outfall under the CNR Mainline from Taylor Avenue to an active storm retention basin, portions of the new land drainage system to service the underpass, which could be used by Contract 2 for site dewatering, a watermain to service the planned pump station, and security fence that needed to be in place prior to Contract 2 such that construction could proceed immediately on spring thaw. All remaining works were packaged into Contract 2 to obtain favourable pricing using economies of scale and simplify co-ordination for all parties.

Concurrent to the contract division, an overall staging plan for the project was determined. This included consideration of third-party utility work, property acquisition timing, and weather restrictions. Four major phases of work were determined, each with numerous stages and sub-stages contained within. Phase I was planned for 2017, which was centred around the detour road and rail line. This allowed for "at grade" construction of the underpass bridge structure in Phase II through 2018. At the same time, sewer and roadworks at the project limits, away from the future underpass area, were constructed. Once the bridge structure was completed, final railworks would bring the trains

"One of the major achievements of the project, is not any given technical achievement, but rather organizing all the pieces of the project together in the right order to ensure the project is completed on time and (under) budget.

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onto the bridge for the first time in late 2018. Phase III works could then commence in 2019, including excavation of the underpass area, and associated sewer and roadworks. Once all roadworks were complete with traffic on the detour road, Phase IV could occur in late 2019, with traffic and pedestrians/cyclists transitioned to the new facility and remaining roadworks staged while maintaining access.

All technical disciplines worked collaboratively to produce staging, which showed proof of concept, and ultimately was used as a blueprint not only for Contract 1 and 2, but for property acquisition timing, third party utility design and construction, and even public and media information.

GEOTECHNICAL

Design

The geotechnical investigation program consisting of test holes and installation of piezometers for the new bridge; was completed in very close proximity to the active CN mainline. Inclusive of this work was identifying and screening the suitability of the existing fill materials.

The project team evaluated different deep foundation types to accommodate space constraints at the underpass, and to achieve the required resistance. Steel H piles were used at the abutments to satisfy the lateral loadings, and rock socketed caissons were used at the intermediate piers to optimize the size of the pile caps.

An intermediate subdrain in the underpass side slopes to intercept and convey the groundwater to the adjacent storm water was recommended to achieve the appropriate slope stability factors of safety.

Swelling in clay due to the removal of overburden was carefully evaluated to enhance the long-term performance of the underpass pavement structure. An optimum time lag between excavation and road construction was utilized to protect against differential heave/recompression.

Construction Administration

Inspection of the rock socketed caissons for the bridge piers was undertaken. Significant variations in subsurface conditions were encountered at two of the nine caisson locations, where competent bedrock was discovered at an elevation approximately 12 m deeper than the anticipated elevation. As the other seven caissons encountered

competent bedrock at the design depth, it was believed that a previous geological feature may have compromised the bedrock here, and therefore, additional testing was completed to confirm the depth to competent bedrock. Once the depth was confirmed, the two caissons were re-designed to accommodate the additional length of an inner sleeve and a smaller diameter rock socketed caisson.

UTILITY COORDINATION

Design

Dillon/AECOM undertook the coordination of third-party utilities, including Manitoba Hydro Power and Gas, BellMTS, Shaw, and Teraspan. A compilation of record drawings from the City's underground structures department was digitized, and a utility database created in Civil 3D. All the lines were assigned attributes indicating the source of the record, the type of shallow utility inclusive of size and importance (e.g., high pressure gas main, or 66 kV hydro line), and quality of information in accordance with ASCE 38-02. With this database, the design files were added and conflicts could be identified. When complete, the data was dumped to build a Utility Matrix.

The Utility Matrix was developed based on the TAC - Guidelines for the Coordination of Utility Relocations. Where buried utilities, such as high voltage power lines or high-pressure gas mains, would pose a significant conflict that could not be accommodated by changes in design, the conflicts were flagged for future investigation. Ultimately, approximately 70 conflicts were identified, where 30 conflicts were flagged to be completed as part of a hydro excavation locates program. Of note, a 25 kV line at Taylor Avenue and Waverley Street, which was buried in advance to accommodate this project, was determined to actually be too shallow for construction. Catching this conflict in advance of actual construction saved the project from a year of delay in roadwork construction, as it would only have been caught during excavation.

Utilizing the Utility Matrix, the project team was able to proactively engage third party utilities and have long lead time relocations, such as the 66 kV hydro tower at Wilkes Avenue and Waverley Street and the buried 25 kV line along Taylor Avenue, completed in advance of construction, ultimately ensuring there were no major delays due to third party utilities.

Construction Administration

During the construction phase, the team managed smaller scale utility issues and arranged for services such as installation of traffic signals and street lighting, along with utility services for the pump station.

LAND DRAINAGE, WATER AND WASTEWATER

Design

The project included the design of the land drainage sewer (LDS) system servicing the new underpass, a new drainage system servicing the Taylor Avenue twinning, and other miscellaneous drainage improvements. The project area was located within the Ash Combined Sewer District (CSD), Cockburn CSD, and the Somerset LDS District. During the design phase, the impacts on the existing storm retention basin (SRB) 6-22 in the Somerset LDS District were reviewed for its response to receiving the drainage from the 15 ha drainage area along Taylor Avenue, and 3 ha of drainage in the depressed section at Waverley Street and Taylor Avenue as part of the Underpass. It was determined that some increases in levels and drawdown time would be experienced in SRB 6-22, but the benefits of the reduction in basement flooding in the Ash CSD exceeded the concerns related to the impact on SRB 6-22, and therefore, all surface drainage south of

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Mathers Avenue within the project area was ultimately routed to SRB 6-22.

The Taylor Avenue twinning work was designed to remove the surface drainage from the Ash CSD, and collected it to a new LDS system ranging from 450 mm to 1050 mm approximately 1.1 km in length, ultimately connecting to the 1500 mm outlet to SRB 6-22. The 140 m of 1200 LDS was installed using an Akkerman Tunnel Boring Machine beneath the live CN Railway.

Due to the rail reconstruction, the underlying 900 mm Mid-Town feedermain was realigned with 62 m of 900 mm AWWA C900 PVC pipe cased in a 42.5 m long 1500 mm epoxy coated steel pipe designed for trenchless installation methods. The steel casing pipe was installed using a guided auger boring system under live CN tracks causing no disruption to rail traffic.

Construction Administration

Of note during construction, a relocation of a 400 mm watermain resulted in the installation of three new valves to allow for isolation in accordance with CN standards, and improve reliability of the City's water distribution system. Within the project site there were multiple high-risk users, and therefore, the installation of the three valves was completed in a single 8-hour shutdown which was coordinated by the project team.

PUMP STATION

Design

The pumping station is designed to convey storm water from the depressed road section to the existing SRB 6-22. The pumping station has a capacity to accommodate the 25-year and 50-year design storms, respectively. The pumping station is configured with three submersible vertical axial flow duty, each with a capacity of approximately 700 l/s. Two submersible sump pumps are utilized to handle minor rainstorm events and maintain a dewatered wet well.

Selection of the location of the pumping station was one of the initial challenges encountered in design. The property surrounding the project area is largely developed and occupied by a mix of commercial and residential properties. Positioning the pumping station on the west side of the underpass provided the shortest possible route for drainage to SRB-22; however, further consideration and collaboration was required to facilitate safe construction of the detour road immediately west/southwest of the pumping station, construction of the rail shoofly immediately north of the pumping station, as well as excavation of the depressed area of the underpass.

During the design phase, a hydrogeological investigation was conducted which resulted in discovering the upper 1.5 m of limestone bedrock was highly fractured and capable of producing significant volumes of groundwater. To mitigate the concern of basal heave in the excavation, a bedrock depressurization system was implemented to temporarily lower the groundwater pressures in the aquifer during construction. Prior to installation, an inventory of existing groundwater users in the area was conducted and the operating criteria for the depressurization system were selected to minimize the potential for adverse effects on third party groundwater systems. A groundwater monitoring plan was implemented for the duration of pumping to verify that adverse effects to the existing groundwater users were not occurring. A system of pumping wells were in operation for the duration of excavation activities and were eventually decommissioned upon backfill of the pumping station.

Construction Administration

The construction of the pumping station commenced in March of 2018 and was functionally operational for the opening of the underpass on August 18, 2019. Formal commissioning activities were carried out in mid- September of 2019. Work consisted of the construction of a reinforced concrete substructure, masonry wall superstructure with a wood frame roof, process mechanical systems, HVAC systems, electrical systems, and connections to services (electrical, gas, and water) and LDS intake and discharge connections.

RAIL

Design

Dillon/AECOM reviewed four shoofly and detour road combinations, shoofly north/detour east, shoofly north/detour west, shoofly south/detour east, shoofly south/detour west, all having new rail crossovers located to the east of the shoofly. The shoofly south/detour west alignment was selected based on impact to stakeholders and constructability. Raising the rail one foot in elevation was deemed to provide needed clearance over Waverley Street, while being cost effective for length of runout of grade on the rail.

The challenge was to build the shoofly and detour road that would work with both the existing and raised elevation of the mainline. This was done through careful staging. The CN signals were installed in order that they could be activated for any combination of the

shoofly and mainline tracks during the life of the detour road. Track panels were installed in the detour road for the shoofly prior to any of the shoofly work being started to minimize the length of time the detour road would have to be closed after it was opened for traffic. A weekend closure of the detour road was scheduled to remove the existing main track material, raise the embankment one foot, and install new track panels complete with detour road paving to match.

After the project was tendered, CN advised that the crossover locations should be revised, as well as to install a separate turnout for a future third track south of the south main track. This required revising the 806 m long shoofly to accommodate three turnouts that must not impinge on bridge construction. This presented challenges for both horizontal and vertical curve design, but was completed and issued as a major change order.

Construction Administration

CN undertook track construction for both the shoofly and main track, which introduced an additional contractor onsite. Coordination between the two groups fell to AECOM who had been engaged by CN to assist in their work.

BRIDGE

Design

The preliminary design of the bridge structure included three options for the superstructure. These options included through-plate girders, precast prestressed concrete box girders, and a steel beam span encased in concrete. Each option consisted of four simply supported spans. The substructure for all three options was similar with abutments founded on steel H-piles, and three piers founded on rock-socketed caissons. Ultimately, the steel beam span option was chosen based on an evaluation of the three options taking into account cost, aesthetics, ease of future rehabilitation, material usage, and input from CN.

Detailed design was subsequently carried out for the preferred option of the steel beam span encased in concrete. Each span consisted of

THE SCALE OF THE PROJECT WAS AN ACHIEVEMENT:

- 10.4 lane kilometres of new roadways
- 6.8 lane kilometres of rehabilitated roadways
- 2.4 lane kilometres of detour road
- 2.0 kilometres of multi-use path
- 1.3 kilometres of bike paths
- 4.1 kilometres of sidewalks

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ten girders. Inherent to this particular superstructure design for use as a rail bridge is the consideration of the steel girders only for the Strength design check. The cast-in-place infill slab that encased the steel spans was only considered for Service Limit States design checks, and was therefore only used to account for deflection control. This meant that the steel girders were designed to carry the entirety of the AREMA Cooper E90 locomotive live load and dead load for the Strength design.

The proposed superstructure was a filler beam deck system (cast-in-place infill slab). This system consists of a concrete slab with stiff longitudinal reinforcement made of rolled beams or plate girders, and reinforcement bars in the transverse direction. Closely spaced steel beams and concrete act compositely, and mechanical shear connectors (studs) are not required, but as discussed, the steel beams were required to carry the entire live load, making superstructure depth a challenge.

The bridge substructure consists of two pier bents made of cast-in-place concrete drilled shafts, rock- socketed caissons and two semi-integral abutments with parallel wing walls supported by steel H-piles. The rock socketed caissons had an approximate length of 21 m and diameters of 1219 mm. The rock sockets were up to 5 m in length and had diameters of 1067 mm. The H-piles were approximately 18 m in length and consisted of HP 360 x 132 sections.

The caissons supporting the piers to bedrock were a complex task. In order to prevent sloughing of the caissons during construction the contractor used a safety sleeve of 1800 mm diameter. A 1500 mm hole was then drilled to approximately 3 m above the tip elevation of 210 m and a sleeve was inserted. A bentocrete infill was poured to stabilize the two sleeves. The bentocrete was augered and a 1219 mm working sleeve was advanced to the design elevation. The working sleeve was then removed and the permanent sleeve was installed. The rock socket was then advanced into bedrock. The rock socket was investigated via video feed to ensure that the socket was free of debris that would affect the performance of the caisson. The caisson was then poured. Flowable fill was then used between the 1800 and 1500 mm sleeves before the sleeves were removed and the 1219 mm sleeve was cut to the final elevation.

Construction Administration

Over 150 submittals, submittal revisions, and RFI's were reviewed and responded to for the structural works alone, spanning approximately two years. The project duration put an emphasis on exemplary document tracking as a tool for retrieving information during and post construction.

The structure was designed to be built "at grade". That is, minimal excavation was required to create space to construct the caissons, and then form the pier caps and superstructure. This allowed for close proximity of the shoofly tracks

and detour road, minimizing property take or expensive and time consuming temporary sheet pile walls. Once the bridge was carrying CN trains, excavation of the underpass occurred revealing the caissons to their final exposed depth, and sub-structure and roadside protection works could be completed.

ROAD AND PATHWAYS

Design

A transportation study was undertaken early on to predict future travel volumes and operations needed to design the final infrastructure. In addition, the study analyzed demand for the 2017-2019 period during construction. This was to confirm the necessity of a four-lane road detour with multi-use path, and its capacity to handle traffic, including diversions from the Pembina Highway/ Jubilee underpass area that was also lane constrained at the same time.

A process of site correcting the City's overall macro-scale TransCAD model, and then feeding volumes and growth rates into the Dillon developed micro-scale Synchro simulation model was used. Intersection and link design was then developed to accommodate traffic growth. For example, after various scenarios, a new northbound through lane was extended from a point south of Wilkes Avenue/Hurst Way, through the intersection up to Taylor Avenue where it becomes a dedicated right turn lane. While somewhat unconventional, this elegantly solved a through lane queuing issue and is operating well today. The model was also used to confirm that twinning Taylor Avenue west of Waverley Street was justified and thus added to the project scope. Another unique application was the analysis of the detour road, specifically the operation of the intersections. The project team were able to show that by strategically eliminating certain left turn movements, two intersections could operate in very close proximity north of the tracks, and maintain access for the majority of commuters through the area. In fact, some movements, like northbound Waverley Street to eastbound Taylor Avenue, actually flowed better than

pre-existing conditions. A review of the active transportation facilities was undertaken including counts of vulnerable users crossing the CNR mainline. An opportunity to construct a new multi-use pathway through an underutilized linear City right-of- way was negotiated. The underpass itself has a delineated separate sidewalk and bike path due to the high volume of users through this "choke point". Transit routes were redesigned to use the detour and bus stops optimized for convenient transfers and boarding/alighting areas.

A geometric design criteria (GDC) was developed to shape the detailed design of facilities, including the detour road. Vertical design was an intricate process to balance constraints such as the rail elevation, and close proximity of Taylor Avenue. It also had to work with the temporary detour road. To save cost, portions of the detour road were designed to simply be a skiff of fresh asphalt overtop of Taylor Avenue, yet with corrected drainage and superelevation. A pavement life cycle cost analysis confirmed an asphalt topped structure to be most advantageous, but the design team considered concrete in areas where staging or constructability governed.

Construction Administration

The scale of the project was an achievement:

- 10.4 lane kilometres of new roadways
- 6.8 lane kilometres of rehabilitated roadways
- 2.4 lane kilometres of detour road
- 2.0 kilometres of multi-use path
- 1.3 kilometres of bike paths
- 4.1 kilometres of sidewalks

Using the staging developed, pedestrian/ cyclist access was maintained during construction with care to provide positive delineation and signage in an ever-changing construction site. By using hand placed concrete pavement in areas immediately adjacent to live traffic, much more roadway could be constructed without disrupting the public with

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slow moving asphalt trucks, pavers, and rollers. Products such as geogrids were used to span poor subgrade, or to accelerate construction when the subgrade was too wet for traditional construction methods. Each winter, new lanes and pathways were opened as they could be made safe so that capacity and access continually improved through the three years of major construction.

LANDSCAPING

Design

AECOM undertook the landscape architectural design for the project. Beyond the normal selection and placement of groundcover and tree species in the medians and boulevards along Waverley Street and Taylor Avenue, the landscape architectural design involved a number of private land ownerships.

Landscape designs were produced for the private land owners that were affected by changes to their legal boundaries, mainly along the altered property lines, but in a few cases, a larger portion of their lands. Fencing, grass, trees and shrubs were affected and in the case of a school, their sports fields. Multiple design options were produced.

It was known early on that a public art component was going to be part of the project. In consultation with the artist, the landscape design was modified to help integrate the art into the landscape.

Construction Administration

Existing trees on Taylor Avenue were going to be affected by the underground works. Through consultation with Public Works and Urban Forestry, some LDS was redesigned to avoid mature trees to preserve and protect the canopy.

Coordination of fencing on the school yard site was of utmost importance due to the school yard being adjacent to the railway tracks and service road. The temporary fence had to be installed prior to the removal of the existing fence and when the temporary fence was no longer required, the permanent fence had to be installed prior to the temporary fence being removed.

Meet Dr. Marcia Friesen

Dean of the Price Faculty of Engineering at the University of Manitoba

By Megan Funnell

UM | Price Faculty of Engineering

Dr. Marcia Friesen, P. Eng., Ph.D., Dean of the Price Faculty of Engineering at the University of Manitoba, has a vision for the Faculty and future landscape of the engineering community – one that celebrates diversity, inclusion, collaboration, and opportunity.

As it stands, enrollment in the University's engineering program, per capita, is below the national average. Dr. Friesen's goal, to increase enrollment by 25%, comes with an innovative twist and welcoming openness to attract potential students from all backgrounds. Dr. Friesen explains that this goal comes with an opportunity to develop new focus areas within their programs and create an educational space that celebrates diversity and inclusion. "We're looking at new minors, new specializations across our disciplines with other Faculties and have some great opportunities to work with our business school on leadership and entrepreneurship minors and so on," says Friesen.

Along with the enrollment increase, Dr. Friesen plans to revitalize the University's approach to recruitment by going beyond the predicted platforms. "We want to showcase the diversity that

bought out by Stantec. After a few years, Dr. Friesen worked for DGH Engineering, a consulting firm, located in St. Andrews, MB, that specialized in agricultural and industrial engineering.

Dr. Friesen explains that these roles 'rooted' her understanding of engineering practice in that sector and considers this realm to be her 'professional home' in a sense. "I have a lot of affinity for consulting engineering services – particularly how public facing it is and the obligations that come with it," says Friesen.

"I truly believe that engineering can address any motivation." – Dr. Marcia Friesen

exists in the profession and let everyone see themselves in it," says Friesen.

Dr. Friesen's vision for the future reflects her past experiences studying, working, and building a career in the engineering field. Her career began in the consulting engineering services industry, where she worked at ID Engineering Canada: a local firm in Winnipeg, MB, that was eventually

In 2003, Dr. Friesen joined the team at the University of Manitoba as the Director of the Internationally-Educated Engineers Qualification (IEEQ) program: a qualification recognition program for newcomers to Canada who wish to continue their engineering career and earn their professional license with the Engineering Geoscientists Manitoba (EGM).

"These folks who have emigrated to Canada – they're usually in their 30s or 40s, they usually bring their families with them, and they've earned their engineering degree and often have work experience in their home country – are looking to re-enter the profession here and, to do that, they need a pathway to be registered as a P.Eng. The IEEQ program provides that pathway," says Friesen.

Friesen's experiences developing the IEEQ program led her to other roles within the University – all with the common theme of administrative leadership – where she would develop programs for the entire Faculty (not just one department of discipline).

In 2017, Dr. Friesen became an Associate Dean at the Faculty of Engineering – specifically for Professional Practice and Design Education – that she describes as being "the parts that don't fit neatly under the undergraduate or graduate program" in the Faculty.

"I was responsible for our educational partnerships with our industry community and engineering education program, which was a relatively new and emerging discipline," says Friesen. "I coordinated the establishment of a new degree option in engineering education, which has really taken hold in U.S. schools and now Canadian schools are following suit. That was very meaningful to me."

Dr. Friesen earned her Master's degree in Post-Secondary Studies (in education, not engineering) and Ph.D. in Biosystems Engineering at the University of Manitoba. Dr. Friesen explains that her Master's degree complements her professional background and interest in training practitioners, who are entering the engineering field.

"In each of my courses and my thesis, they were very closely integrated with engineering because it was all focused on the process of educating engineers. And my Ph.D. was in engineering, so I managed to make it as interdisciplinary as possible – again, looking at engineering education."

Dr. Friesen describes earning her Master's degree as being more about 'the journey than the destination.' Looking back, she says this journey foreshadowed her interest in administrative leadership in university and college education.

"I feel like every step I've taken has logically led me to the next step," says Friesen. "I learned to trust that sense of ambiguity."

In January 2021, Dr. Friesen stepped into her current role as Dean of the Price Faculty of Engineering at the University of Manitoba. Her team – comprised of three Associate Deans, seven Department Heads and Program Directors, and one Finance & Business Manager – is dedicated, thoughtful and represents the student body with its diversity of backgrounds, identities, and ideas. Together, they will show that the foundation of an engineering degree is very beneficial for other industries.

"I truly believe that engineering can address any motivation," says Friesen. "Whether you're here to express art and creativity, to push the edge of technology, or to implement social justice, engineering can meet those intrinsic reasons for being here. There are numerable pathways within the boundaries of what's defined as an 'engineer' – so if you have a problem you want to solve, I'm sure that engineering will have a path for you to solve it."

Dialogue

The benefits of telemedicine

The fast pace of modern life, coupled with ongoing public health restrictions, means that telemedicine is rapidly increasing in popularity. This isn't surprising, given that virtual clinics offer a number of advantages, including shorter waiting times. Here's an overview of the telemedicine services offered by Dialogue, with Alexis Smirnov, the company's co-founder and Chief Technology Officer.

Fast access to care

Dialogue is one of Canada's leading integrated virtual health platforms. "We cover everything related to primary care and mental health. Our services include prescriptions, prescription renewal, referrals to specialists, outpatient clinics and laboratories," says Alexis Smirnov.

With round-the-clock services, a mobile app, live chat and tele-consultations, Dialogue saves patients an average of 4.1 hours, according to internal data compiled by the company.

"We start with a quick triage using artificial intelligence. Then, a care coordinator refers the patient to the right healthcare professional for their problem. If the patient is given a prescription, it can be sent to a pharmacy near their home or workplace. It can even be delivered to the patient's home or office. And we always follow up with the patient a few days later. Continuity of care is important to us at Dialogue," says Smirnov.

Convenient and secure

Dialogue doesn't claim to replace the current healthcare system. "Our services are complementary. At Dialogue, we can resolve more than 70% of patients' problems directly. The remaining 30% of cases require exams, treatments or tests done in person. But that doesn't mean we abandon those patients. We'll make an appointment for them in a public or private clinic close to their home or workplace. We make it easier for patients to navigate the process," adds Smirnov.

Access to Dialogue's virtual healthcare services is usually reserved for employers and organizations. **But it is also included, at no additional cost, in National Bank's banking offer for engineers**.

Access to the service is unlimited. There are no monthly or annual caps to worry about. And there will never be additional charges for patients.

In addition to all these benefits, Dialogue is highly secure. "Our cybersecurity is robust, and all our data is stored in Canada," says Smirnov.

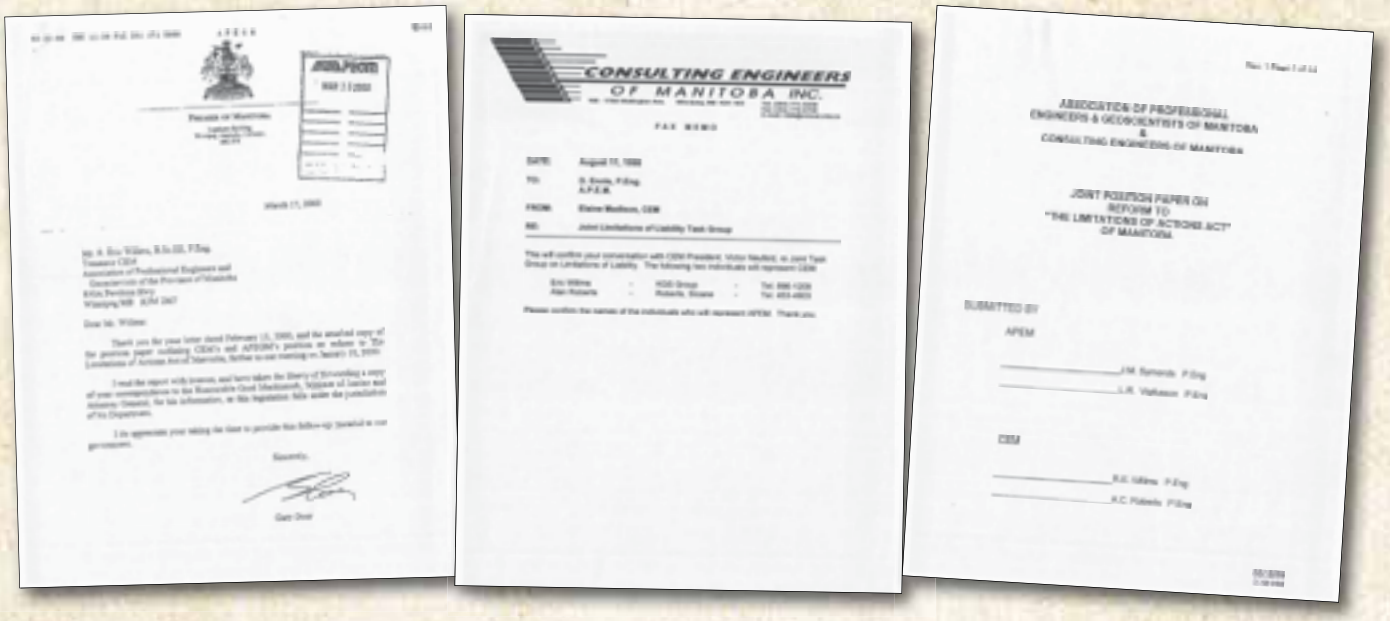
NATIONAL BANK

Our offer for engineers just got even better

To learn about the new benefits, including virtual healthcare services and legal assistance provided by our official partners, visit **nbc.ca/engineer**.

The Limitations Act

Historic Change in Manitoba



The Limitations Act – Bill 51 (formerly known as Limitations of Actions Act) passed third reading on May 20, 2021 and received Royal Assent. On October 27, 2021 The Limitations Act was Proclaimed into Law and will come into force on September 30, 2022!

ACEC-MB along with other associations including Engineers Geoscientist Manitoba, the Winnipeg Construction Association, The Manitoba Association of Architects, the Association of Manitoba Land Surveyors and the Certified Technician and Technologists Association of Manitoba have worked jointly for many years to ensure that both the basic and ultimate limitation periods are in line with other provincial jurisdictions.

The Limitations Act sets the Basic Limitation Period in Manitoba to 2 years and the Ultimate Limitation Period to 15 years (down from 30).

Comparison of Basic and Ultimate Limitation Periods - prior to Bill 51

Province	Year of Reform	Basic Limitation Period (years)	Ultimate Limitation Period (years)
British Columbia	2013	2	15
Alberta	1999	2	10
Saskatchewan	2005	2	15
Manitoba	1931	2/6/10	30
Ontario	2002	2	15
New Brunswick	2012	2	15
Nova Scotia	2014	2	15

SUMMARY OF CHANGES AND DEFINITIONS:

Basic limitation period

The previous Limitation of Actions Act had several limitation periods ranging from two to ten years, based on the type of legal action. *The Limitations Act* replaces those periods with a single limitation period of two years, which begins to run from the day the claim is discovered. A claim is discovered when the person with the claim knew, or ought to have known, the material facts.

Ultimate limitation period

Even if a claim has not been discovered within 15 years of the event that gave rise to the claim, an action started after the 15th anniversary of that event will be statute barred. This 15-year period is called the "ultimate limitation period".

No limitation period

The new Act lists a variety of proceedings for which there is no limitation period, such as proceedings arising from a sexual assault.

Suspension of limitation periods

A limitation period is suspended during the time a claimant is a child or under a disability, or if the person who is to defend the claim has concealed it from the claimant or willfully misled them.

Financial claims

Detailed rules are provided for determining whether claims of a financial nature have been acknowledged by the debtor, in which case the limitation period for the claim begins to run again.

LIMITATIONS HISTORY – HOW WE FINALLY GOT HERE!

March 8, 2021 – Province introduces new legislation that would repeal The Limitations Act (Province of Manitoba Press Release)

Bill 51 creates a simpler, more modern limitations system that would align with other jurisdictions.

The Manitoba government is introducing legislation that would repeal and replace the outdated Limitations of Actions Act with a simpler, modern act that would enhance access to justice and make it easier to do business in Manitoba, Justice Minister Cameron Friesen announced today.

"We must act to simplify Manitoba's Limitations of Actions Act, which creates barriers to trade in Manitoba and is out of date," said Friesen. "Bill 51 will bring Manitoba in line with other provinces that have already simplified and modernized their limitations laws."

Statutory limitations ensure that a person can no longer seek the assistance of the court to enforce a legal right after a certain period of time. Currently, different limitations apply to specified causes of action in Manitoba, creating confusion.

Bill 51 would introduce a streamlined structure based on a two-year 'basic' limitation and a longer 'ultimate' limitation, aligning with the legislation with other jurisdictions. This approach will simplify the law, promote efficiency of the civil justice system and create more certainty as to when the timeline begins.

"The act has been a long-standing source of frustration for individuals, businesses, lawyers and others. Our government is acting on recommendations made by the Manitoba Law Reform Commission, which had received numerous submissions through a public consultation process," added Friesen.

In addition, a number of professional stakeholders, including architects, engineers, surveyors and construction companies, have expressed the importance of harmonizing limitations statutes to help reduce trade barriers.

> This approach will simplify the law, promote efficiency of the civil justice system and create more certainty as to when the timeline begins.

The minister noted that Bill 51 would level the playing field to ensure legislative parity while making it easier for professionals and skilled tradespeople from other jurisdictions to work in Manitoba, while strengthening the competitiveness of the province and would help the economy grow.

2020 - Limitations of Actions Act Reform Working Group

In 2020 representatives from seven professional organizations working in the construction/design industry met with the Provincial Government to determine how the group could assist in moving changes to the act forward.

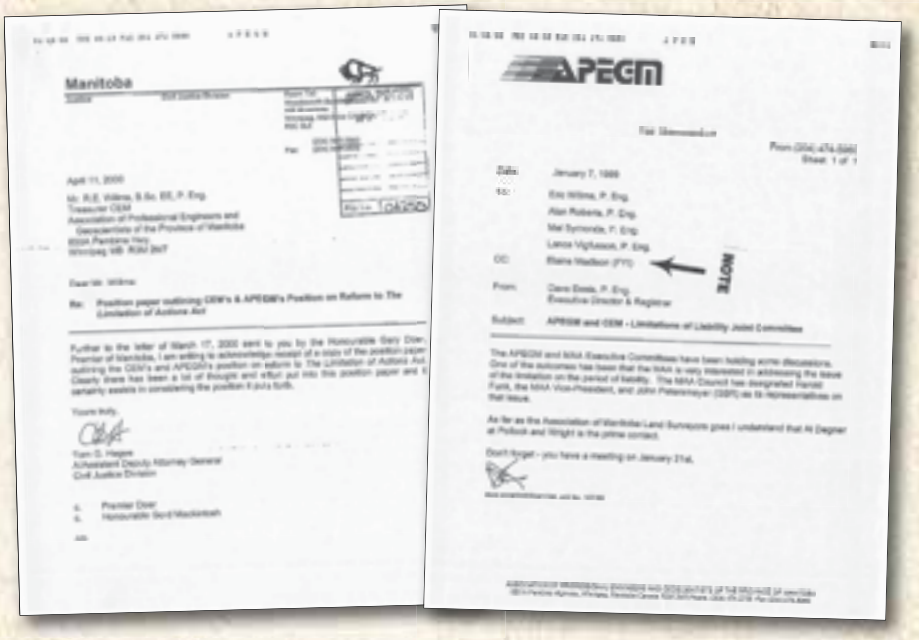
November 19, 2019 - Speech from the Throne

During the November 19, 2019 Speech from the Throne the following statement was made:

> "Amendments to Limitation of Actions legislation will also be brought forward to bring Manitoba in line with the rest of the country."

2017 – 2021 (Summary information provided by Engineers Geoscientists Manitoba)

The Engineers Geoscientist Manitoba Limitations of Action Task Group was created in November 2017 to engage stakeholders who had the expertise, ideas and passion to support and advocate for lowering the limitations periods. The Task Group worked with the Engineers Geoscientists Manitoba Government Relations Department to develop and submit a proposal for changes to *The Limitations of Action Act* to the Minister of Justice at the time. Initially, the government anticipated addressing the Association's issues through a private member's bill to exempt Engineers Geoscientists Manitoba from the Act, but later determined that a government-


Manitoba

APEGM

NOTE

"The Engineers Geoscientist Manitoba Limitations of Action Task Group was created in November 2017 to engage stakeholders who had the expertise, ideas and passion to support and advocate for lowering the limitations periods.

sponsored bill was the approach to take, replacing *The Limitations of Action Act* entirely.

The ACEC-MB Board and Government Relations Committee worked alongside the Engineers Geoscientists Manitoba Task Group in pursuing the focus on bringing the limitation periods in Manitoba to be consistent with other provinces.

2009 – 2017 Summary

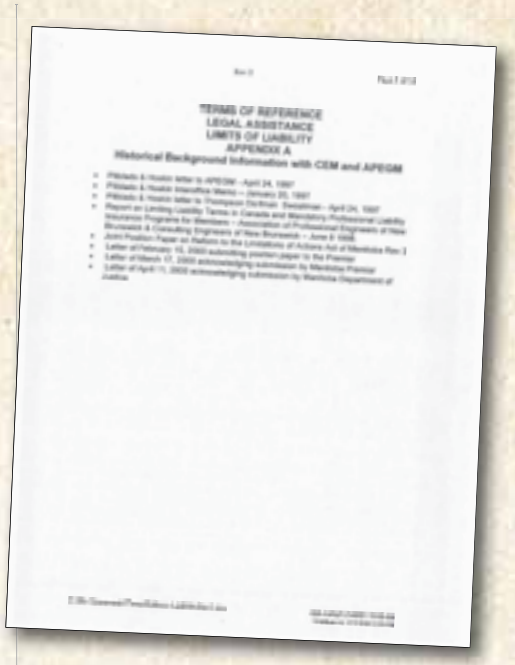
In 2009, six associations including ACEC-MB, Engineers Geoscientists Manitoba, the Winnipeg Construction Association (WCA), The Manitoba Association of Architects (MAA), the Association of Manitoba Land Surveyors (AMLS) and the Certified Technician and Technologists Association of Manitoba (CTTAM) jointly submitted a recommendation for amendments to The Limitations of Action Act to the Manitoba Law Reform Commission. In 2010, the Manitoba Law Reform Commission released a report on Limitations of Actions in Manitoba with 38 recommendations, including that the basic limitation period should be two years from discoverability for all claims and that the ultimate limitation period should be 15 years. The Associations continued to pursue follow-up on the recommendations throughout this period of time.

The Old Days

Correspondence and records on the efforts of Consulting Engineers of Manitoba (CEM) to make **changes to the Limitations of Liability Act goes back to 1998**. At that time the CEM Executive Director began reaching out to other provinces to gather information on each jurisdictions liability periods.

ACEC-MB (at the time CEM) along with Engineers Geoscientists (at the time APEGM) struck a Joint Task Group on Limitations of Liability in August 1998. A Joint Positon Paper on reform to The Limitations of Actions Act of Manitoba was drafted in 1999 and submitted to the Province of Manitoba in February of 2000.

In 2000 the Manitoba Architects Association (MAA), Associations of Manitoba Land Surveyors (AMLS) and The Certified Technicians & Technologists Association of Manitoba (CCTAM) were invited to join the Joint Task Force. In 2002 these groups along with The Winnipeg Construction Association (WCA) drafted and submitted a "Proposal to amend the Limitations Period affecting Engineers & Geoscientists, Architects, Land Surveyors, Certified Technicians & Technologists and Construction


TERMS OF REFERENCE
LEGAL ASSISTANCE
LIMITS OF LIABILITY
APPENDIX A
Historical Background Information with CEM and APEGM

Contractors. Through all these years the Associations have continued to work together to purse the recommended changes. From the consulting engineering perspective, the 30 year ultimate limitations period put the local consulting industry at a disadvantage compared to their peers in other Provinces and created a barrier to investment.

BRACE/Manitoba Climate Resilience Training launches Climate Change Foundational and Infrastructure Focused Courses

BRACE is a five-year (2017-2022), $18 million Natural Resources Canada initiative, delivered in this province by Manitoba Conservation and Climate. In 2020, Engineers Geoscientists Manitoba was the successful proponent for a project developing and delivering sectoral training for engineers and other infrastructure professionals and decision-makers by March 31, 2022.

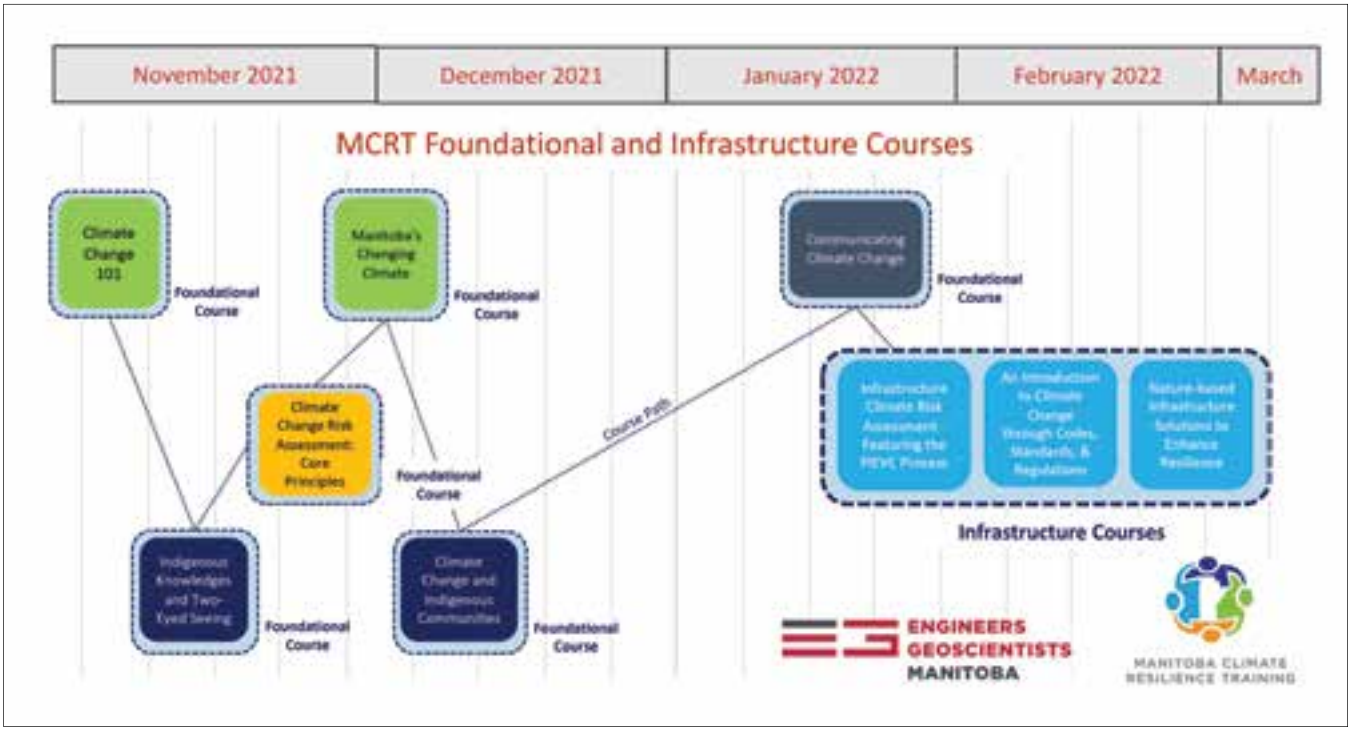
Impacts from climate change are happening now. We see those impacts becoming more frequent and severe with each passing year. The Association of Consulting Engineers of Canada stated its position in 2020 that engineering professionals should consider climate change in their work. Do you want to learn more about how to incorporate Climate Resiliency into your Infrastructure practice?

The Building Regional Adaptation Capacity and Expertise (BRACE) Program, known within Manitoba as the Manitoba Climate Resiliency Training (MCRT) project, is offering a free, comprehensive training program this fall and winter to enable engineers and other infrastructure professionals and decision-makers to integrate climate resiliency into their designs and practice by accessing and applying new knowledge and tools. Each course is 60 to 90 minutes long and will be offered live through zoom as well as on a recorded basis.

The "Foundational and Infrastructure path" of nine courses was developed following several engagement sessions with stakeholders and practitioners including Government of Manitoba engineers. A survey by Engineers Geoscientists Manitoba that received 1001 responses from approximately 8500 practitioners confirmed that the level of interest in the impacts of a changing climate on professional practice was high and outlined training priorities. An advisory group comprised of engineers working in the private, public and educational sectors, supplemented by experts in architecture and the construction industry, has also been instrumental in clarifying training needs and priorities. The path of courses is laid out in the diagram below.

Three of the nine infrastructure path courses are being directly developed and delivered by Engineers Geoscientists Manitoba's BRACE/MCRT project team:

- **Infrastructure Climate Risk Assessment – Featuring the PIEVC process – offered Wednesday, January 26, 2022, 12:00 – 1:30 pm**
  Designing or building infrastructure to last? Using Manitoba-themed example projects and case studies, this course will provide PIEVC tools to conduct climate risk assessment on



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infrastructure systems. Facilitated breakout sessions will guide attendees in conducting a sample assessment.

- **An Introduction to Climate Change through Codes, Standards, and Regulations – offered Wednesday, February 9, 2022, 12:00 – 1:30 pm**
  Learn how Codes, Standards, and Regulations are changing to ensure that our new infrastructure is best prepared for climate changes now and in future. This introductory session is presented in collaboration with Red River College and codes, standards and regulations experts.

  These infrastructure types will be addressed through the course and in breakout sessions:
  - Buildings – ex. energy codes, flood risk, snow loads
  - Transportation
    - Infrastructure – ex. asphalt codes, winter roads
    - Vehicles & Fuels - ex. charging, biofuels
  - Water & Wastewater management – ex. natural flood mitigation, dikes and water diversion, drainage
  - Utilities (Electrical & Natural Gas) – ex. flood and drought
- **Nature-based Infrastructure Solutions to Enhance Resilience – offered Wednesday, February 9, 2022, 12:00 – 1:30 pm**
  Using local Manitoba and Canadian themed example projects and case studies of natural infrastructure, this course will provide a basic understanding using Sustainable/Natural Infrastructure/Innovative Solutions to build resilience to climate change.

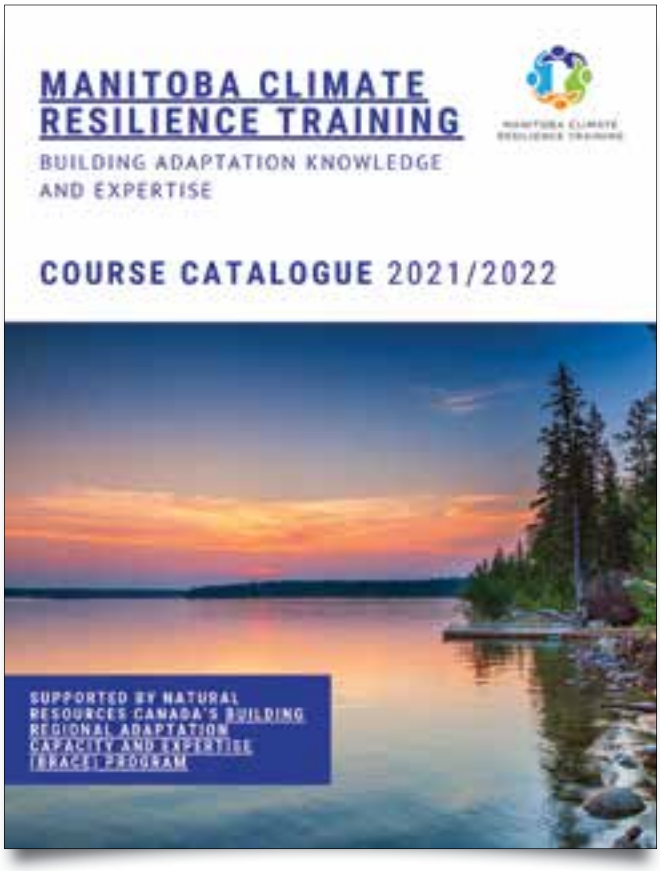
  The course will also introduce and describe measures businesses can consider for potential implementation for climate impact reduction to property, assets, and operations (ex. drainage, power supplies, asset hardening, maintenance program tweaks, monitoring for impacts etc.) This course is being delivered in collaboration with the International Institute for Sustainable Development (IISD).

In addition, the Association's BRACE project team will be offering a **Climate Change primer** session to open up discussion and provide answers to questions raised after attending or viewing these recommended pre-requisite courses along the infrastructure path: *Climate 101, Indigenous Knowledges and Two-eyed Seeing, Climate Change Risk Assessment Core Principles, Manitoba's Changing Climate*. offered **Monday, January 24, 2022, 12:00 – 12:45 pm**.

Interested in more courses about climate change and resiliency? In total, 18 courses are being offered through the Manitoba Climate Resilience Training project's integrator, ICLEI, and the project's four sectors of infrastructure, northern business (led by Dillon Consulting), Indigenous and planning. Although led by the different sectors, any of the courses can be taken by anyone interested.

Registration is open and available on the MCRT website, along with the full catalogue of courses.

Should you have questions about BRACE/MCRT, please send your enquiries to Engineers Geoscientists Manitoba at *GR@EngGeoMB.ca* for forwarding to any of the project team members: Curt Hull, P.Eng., Project Manager; Jeff O'Driscoll, P.Eng., Technical Advisor; and Scott Sarna, Director of Government Relations.



Strong Governance to Achieve Canada's Vision:

ACEC Submission to the National Infrastructure Assessment Consultation

SUMMARY OF RECOMMENDATIONS

Governance of the National Infrastructure Assessment

- ACEC recommends that a permanent, independent, and arms-length National Infrastructure Agency be established to house and support the Assessment. This model would benefit the Assessment and serve as a larger repository of best practices and industry expertise.
- ACEC recommends that when making appointments for the Agency's leadership, the Minister should strive for diversity and inclusion to ensure a balanced board.
- ACEC recommends the creation of thematic working groups that can provide expert insight into key areas of development, to compliment the Agency's leadership. ACEC welcomes the opportunity to join the Agency's leadership, working groups or assist in the process of identifying stakeholders for consideration.

Mandate and Scope of the Assessment

- ACEC recommends that this Agency be provided with a mandate that outlines clear responsibilities to the National Infrastructure Assessment. These responsibilities should be executed on a cyclical basis and should include development, regular updates, monitoring, and progress reports on the Assessment.
- ACEC recommends that the scope of the Assessment include a vision for the next 30 years of infrastructure, a review of the current state of Canada's infrastructure, a clear roadmap forward for the next 10 years, and a consistent cycle of evaluation and improvement to ensure that the Assessment continues to support Canada's infrastructure goals for 2050 and beyond.

Stakeholder Engagement

- ACEC recommends that the National Infrastructure Assessment be developed with broad stakeholder engagement and involvement from industry, municipalities, Indigenous communities and civil society. Part of this engagement would be achieved through the composition of the National Infrastructure Agency however, ensuring the involvement and participation of those who are not on the Agency itself will also be critical to ensuring that all the appropriate stakeholders are engaged.

EXECUTIVE SUMMARY

Throughout Canada's history, connective infrastructure has brought our communities together and linked people from across the country. Despite the strong foundations of these investments, in the last few decades Canada has fallen behind towards ensuring a consistent flow of core infrastructure. As we continue to battle the COVID-19 pandemic, this unique moment offers us an opportunity to fundamentally shift our perspective, priorities and how we look towards the future. How we envision the future of our infrastructure, and the Canada we want to build in 2050, must be a part of this shift.

The federal government's development of Canada's first-ever National Infrastructure Assessment a timely, critical and laudable initiative. As the national voice of consulting engineering firms in Canada, the Association of Consulting Engineering Companies – Canada (ACEC), is pleased to provide feedback on the initial development of the National Infrastructure Assessment. Consulting engineering companies are directly involved on the ground in the delivery of infrastructure projects and know that these projects, along with a long-term vision for the environment and the economy through the National Infrastructure Assessment, are essential to Canada's prosperity and economic stability.

As the government looks to best position the National Infrastructure Assessment for success, ACEC has focused our feedback on developing an economic and environmental vision to guide the Assessment and considerations related to its governance, mandate, scope and stakeholder engagement. ACEC believes that a vision for Canada's environment and the economy go hand in hand. Launching the National Infrastructure Assessment within this vision will establish the Assessment as a central tool for improving infrastructure and improving the social, environmental, and economic quality of life of all Canadians. Part of achieving this vision from the outset will be developing an Assessment with the proper governance structure.

- In learning from other jurisdictions, ACEC is recommending the establishment of a permanent, independent, and arms-length National Infrastructure Agency that would house and support the Assessment. This model would benefit not only the Assessment but could also serve as a larger repository of best practices and industry expertise. This Agency should also be provided with a mandate that outlines clear responsibilities to the National Infrastructure Assessment. These responsibilities should be ongoing on a cyclical basis to include development, regular updates, monitoring, and progress reports on the Assessment.
- Understanding a shared goal of the Assessment to map out the Canada we want to build in 2050, it is certain that this initiative will require a carefully considered scope. To support the Agency in fulfilling their mandate, the scope of the Assessment should include a vision for the next 30 years of infrastructure, a review of the current state of Canada's infrastructure, a clear roadmap forward for the next 10 years, and a consistent cycle of evaluation and improvement to ensure that the Assessment continues to support Canada's infrastructure goals for 2050 and beyond.
- Finally, developing this long-term vision and plan for Canada's infrastructure will require broad

stakeholder engagement with involvement from industry, municipalities, Indigenous communities and civil society. Part of this engagement would be achieved through the composition of the National Infrastructure Agency however, ensuring the involvement and participation of those who are not on the Agency itself will also be critical to ensuring that all the appropriate stakeholders are engaged in the Assessment.

The Association of Consulting Engineering Companies – Canada (ACEC) looks forward to collaborating with the government to develop a National Infrastructure Assessment that bolsters economic growth, supports future prosperity, and fulfills a strategic environmental and economic vision for Canada.

INTRODUCTION

The Association of Consulting Engineering Companies – Canada (ACEC) applauds the federal government's announcement to develop a National Infrastructure Assessment. Public infrastructure is vital to Canada's prosperity and economic stability especially with the uncertainty of COVID-19. Investing in the right infrastructure grows our economy, strengthens and connects our communities and protects our environment. As Canada looks ahead to rebuild from the impacts of the pandemic, governments can know that well-designed and well-executed infrastructure can generate a strong return on investment, as demonstrated in numerous studies linking infrastructure investments and economic performance.

To ensure Canada remains competitive in the post-COVID economy, it is critical to allocate adequate resources towards developing core infrastructure over the long term. Since the 1960s, Canada has seen a consistent decline of infrastructure investments, when 2-3% of GDP was formerly invested every year. Even at the upper end of this range, Canada's annual infrastructure budget is still significantly less than that of other nations which can be as high as 6-7% of GDP. There is an urgent need to return to an adequate annual infrastructure budget to keep pace with our global counterparts.

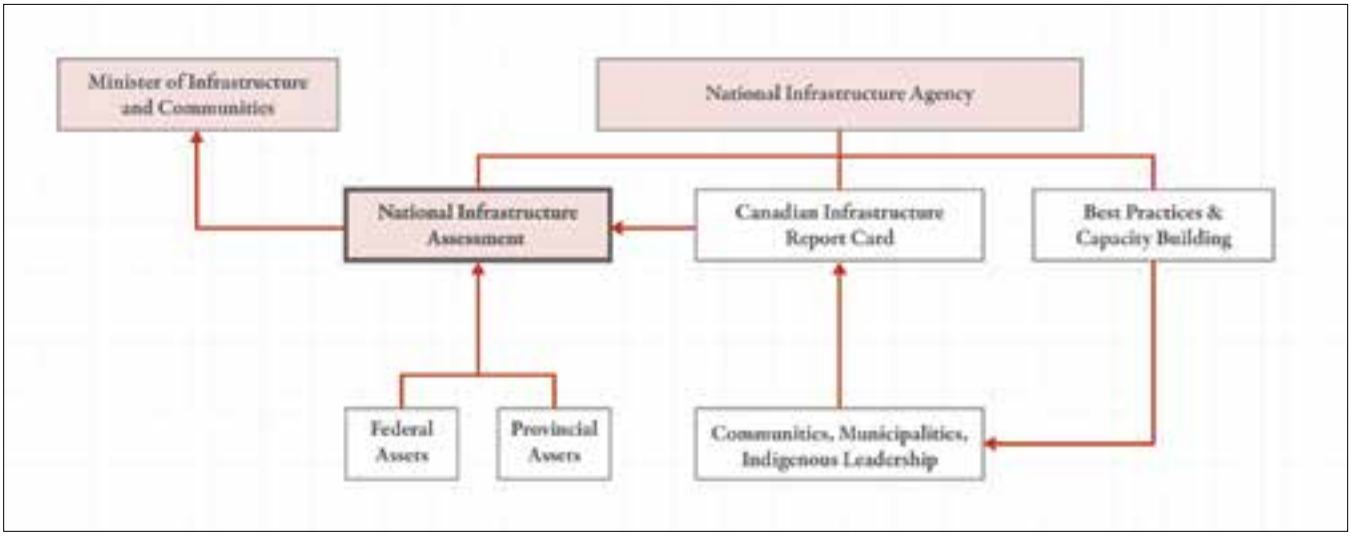
Canada's National Infrastructure Assessment must take an in-depth look at the state of infrastructure to understand and articulate where we are in terms of our infrastructure assets, where we would like to be and then develop a clear road map to reach these goals. Each of these stages should be regularly reviewed and reported on to ensure consistency and efficiency.

ACEC strongly recommends that the federal government create an independent body to conduct, assess and monitor progress, similar to the National Infrastructure Assessment in the UK, which is under the umbrella of a National Infrastructure Agency.

AN ENVIRONMENTAL AND ECONOMIC VISION FOR CANADA

ACEC believes that infrastructure is an effective investment in our social, environmental, and economic quality of life, which is more important than ever as we work to recover from the COVID-19 crisis. This means leveraging infrastructure investments to stimulate the economy, create immediate jobs and improve communities from coast to coast to coast.

For the National Infrastructure Agency and accompanying Assessment to succeed, it is imperative to develop a clear economic vision for long-term prosperity. Much like the concrete goals for climate change and transformational social policy, Canada should develop and implement targets to achieve a vision of the environment and the economy, with infrastructure playing a key role. Therefore, the National Infrastructure Assessment needs to consider not only community-focused public infrastructure but also infrastructure that makes Canada attractive to private sector proponents in industries and sectors critical to a sustainable and prosperous future. Environmental and economic visions can and must be mutually supportive. For example, well considered investments in public infrastructure can incentivize the extractive resource industries to make investments in their Canadian operations, allowing Canada to be a global supplier to the world's high-tech and renewable energy sectors. This approach would also address resource and capacity issues to



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ensure Canada's future is built on world-class, state-of-the-art infrastructure.

Encompassed in this vision for the environment and the economy should be a balanced approach to investing in transformative infrastructure projects, including those focused on sustainability and green infrastructure, while also providing consistent support for traditional core infrastructure. Striking this balance by reliably investing in core infrastructure will provide the economic capacity to invest in long-term, transformative projects. This approach would also provide support to small communities that often most need it. Investing in core, "connective infrastructure" to help Canada build back better also presents an opportunity to reduce, and ultimately eliminate, the existing infrastructure deficit. This will be especially critical in the interim period when the Assessment is being developed while Canada, and the world, begin a long road to economic recovery from the COVID-19 pandemic. Growing the economy will be essential to making further investments in community and social infrastructure more viable in the long-term, while ensuring that the design and construction sector remains stable should future outbreaks of COVID-19 occur in the short-term.

Infrastructure that meets societal needs and that is up-to-date and well-maintained will create efficiencies, encourage investment and generate wealth. The Conference Board of Canada's 2010 report *Lessons from the Recession and Financial Crisis* found that every dollar spent on infrastructure has the potential to increase GDP by as much as $1.20. By contrast, the Residential and Civil Construction Alliance of Ontario notes in their report *Public Infrastructure Underinvestment: The Risk to Canada's Economic Growth*, that infrastructure underinvestment is costing the Canadian economy 1.1 per cent of real GDP annually and reducing the long-term profitability of Canadian businesses by an average of 20 per cent. Stable infrastructure investments also support a strong knowledge-based education pipeline and economy; it ensures there is an adequate supply of well-trained, skilled professionals throughout the infrastructure sector to meet labour demands.

Long-term, predictable infrastructure programs based on the National Infrastructure Assessment would end the "start and stop" infrastructure cycles as one program ends and another begins, while creating attractive and feasible investment opportunities for public funding agencies and private investors. The industries and supply chains that plan, design, build, operate and maintain infrastructure could make informed investments in people, resources, and technology. The same would be true for communities and public agencies, who could plan for the matching often required by federal and provincial infrastructure programs.

This shift is critical to improving coordination among infrastructure owners and funders, as disjointed and inconsistent infrastructure cycles play a significant role in scaring away investments that build connective infrastructure and improve communities. As such, the National Infrastructure Assessment should establish a long-range pathway of projects and programming that allow for clear and consistent financial and resource planning.

Canada's consulting engineering firms are ready and eager to play a key role in building the National Infrastructure Agency to help Canada recover from the impacts of the pandemic and develop grand, national economic goals. Ensuring a strong economic vision with infrastructure playing a lead role in achieving it, the federal government's goals of creating one million jobs, generating lasting community assets, and improving the quality of life for all Canadians can become a reality.

SUMMARY OF CONSIDERATIONS

To achieve the above stated outcomes, ACEC believes the following considerations must be addressed in the creation of the National Infrastructure Assessment:

1. Governance
2. Mandate
3. Scope of the Assessment
4. Stakeholder Engagement

Governance

In developing the National Infrastructure Assessment, all efforts should be made to establish a clear mandate, scope and operational guidance to ensure strong governance. To complement the Assessment, ACEC recommends that the government develop an independent National Infrastructure Agency, modeled in part after the UK's *National Infrastructure Commission* to conduct the Assessment. In the UK's approach, the National Infrastructure Commission was in fact prior to the National Infrastructure Assessment being done. This was done to ensure a nonpartisan structure that could provide a long-term view of infrastructure needs within the UK, free from political interference.

This would provide adequate support for the Assessment and could serve as a repository of best practices and industry expertise.

To ensure the Agency is non-partisan and apolitical, it should be developed as a permanent, independent, and arms-length body like the Canada Revenue Agency or the Public Service Commission of Canada. Its mandate should be to provide the government with a long-term view of infrastructure needs in Canada, including assessments, evidence, modelling and recommendations. Public accountability will be achieved through distinct areas of responsibility between the Agency and government. The Agency will be independent to ensure trust in the data and the government would retain responsibility and accountability for program funding and implementation.

When making appointments for the Agency's leadership, the Minister should strive for diversity and inclusion to ensure a balanced board. To this end, consideration should be given to the right mix of skills and expertise, strong industry and Indigenous participation, and regional representation so that key stakeholders with "an ear to the ground" can best guide the Agency and its work in developing infrastructure over the long term.

To complement the Agency's leadership, ACEC recommends the creation of thematic working groups

that can provide expert insight into key areas of development. ACEC welcomes the opportunity to join the Agency's leadership, working groups or assist in the process of identifying stakeholders for consideration.

Mandate

To ensure a clear delineation of responsibilities, the National Infrastructure Agency should conduct and update the Assessment, and independently monitor and report on progress. Additionally, it would recommend the necessary annual and long-term investment allocations required to address current and emerging needs as well costing the existing infrastructure deficit. The government would consider these recommendations in its allocation of funding.

To ensure accountability and progress, the Agency should make annual public reports to ensure adequate time for federal funding priorities to be established. Government should be required to publicly respond to all Agency reports. Similar to the UK model, the Agency's mandate should be broader than the Assessment. While the federal government plays an important and necessary role in funding and delivering infrastructure, it does not own or operate the majority of infrastructure assets in Canada. In fact, the municipal sector alone owns over 60% of Canada's infrastructure assets. Therefore, ACEC recommends that the mandate of the Agency include other initiatives that will help not only the federal government but also owners, investors and the supply chain to make informed decisions. Our recommendations for such a mandate would include capacity building for infrastructure owners and stakeholders:

- Serving as a "one window" source of state of the industry data, best practices and resources.
- Supporting the development and publishing of "made-in-Canada" best practices relevant and applicable to infrastructure owners including municipalities and Indigenous communities (for example updating and reinstating the National Guide to Sustainable Municipal Infrastructure or creating a new "InfraGuide-2.0".
- Collaborating with and supporting the Canadian Infrastructure Report Card to broaden and standardize data collection/assessment across the municipal sector and Indigenous communities and integrating its findings into the National Infrastructure Assessment.
- Advising federal, provincial and territorial governments on regulatory review and harmonization to increase investor confidence and harmonize coordination between infrastructure owners and funders.

The success of the Agency to fulfill its mandate requires a "data driven" approach to identify and understand infrastructure deficits, set measurable goals and propose a long-term plan to address the infrastructure deficit and achieve the identified goals. Capacity building and encouraging uniformity of asset management practices should also be key in the Agency's work, particularly within municipalities and Indigenous communities. There are many Canadian municipalities that can serve as models for best practices related to asset management and accrual accounting. The Agency should incentivize and draw from municipal asset management plans as it would allow more prescriptive to achieve national and regional goals.

Furthermore, the Assessment should allow funding applications to be based on multi-year and multi-project asset management plans to encourage long-term development and serve as a stable means of infrastructure financing. Communities with robust and well-considered asset management plans can easily demonstrate strategic infrastructure goals that address their local needs, which is why the government should expand support for these plans and allow municipalities and Indigenous communities to use implementation of their asset management plans as the basis for funding, rather than constantly re-applying for funding on a project-by project-basis.

Recognizing the varying approaches to community infrastructure and flexibility required to achieve local requirements would avoid imposing "one size fits all" solutions. All data, modelling and assessments collected and conducted by the Agency should be shared in a timely, transparent, and accessible manner for industry and Canadians at large. The Agency should be legislated under the *Access to Information Act*. The Agency could become a permanent home for the government's *Infrastructure Sectoral Regulatory Review Roadmap* which was developed to "explore broader issues related to construction permitting and to identify what regulatory barriers and bottlenecks exist." By ensuring the National Infrastructure Assessment and accompanying Agency are developed with regulatory review in mind, Canada can move towards better, smarter sector regulations to speed up infrastructure and attract greater private investment.

Scope of the Assessment

ACEC believes there are four elements essential to the scope of a National Infrastructure Assessment to help guide effective and successful infrastructure policy, programs, and investments:

The Vision (30-Year Horizon)

- Broader policy objectives: societal, economic and environmental
- Projection of need and functional requirements of infrastructure assets
- Strategic prioritization of investments

The Current State of Canada's Infrastructure

- An inventory of current assets
- The current capacity of assets
- The physical state of current assets and remaining service life

The Roadmap Forward (10-Year Horizon)

- Identification and prioritization of goals to achieve the vision
- Projection of required investments
- Recommendation of specific investments (strategically important assets and programs to allow communities to achieve goals)
- Recommendations on program design and metrics to measure progress

Evaluation and Continuous Improvement

- Each of the three aforementioned elements should be living documents in order to reflect the state of the world, the state of

technology, ongoing progress and available resources
- Each of these living documents would be formally reviewed for both effectiveness and progress then updated on a sequential, rotating three-year cycle (one per year)
- Both the tri-annual review and updated documents should be public and the Minister would be required to respond to them on behalf of the government

It will be important to provide clear direction as to the expected breadth and detail of the assessment. This will require extensive consultation and buy-in from all stakeholders. Considerations would include such things as:

- Levels of government and agencies covered (local, regional, national, Indigenous)
- Scale and nature of assets covered
- Information to be collected and metrics
- How information is presented and can be accessed
- Expected scope and detail of recommendations to be presented
- Managing ongoing updates and revisions (within three-year cycle)
- How reporting on progress is most effectively presented

The breadth and detail of the assessment process would be expected to evolve to reflect the ongoing review and update process as well as the government's investment in the capacity and resources of the National Infrastructure Agency.

Stakeholder Engagement

To ensure that the Agency draws upon the necessary expertise to fulfill its mandate, the Agency should actively engage industry, municipalities, Indigenous communities and civil society in developing its modeling, reports and recommendations. This process should be an evergreen and ongoing initiative, with new assessments conducted at regular intervals. Thorough stakeholder engagement can be achieved with a strong leadership team and thematic working groups, as well as ad hoc consultations with industry partners.

Through this approach, the Agency could leverage the important and ongoing work of the Canadian Infrastructure Report Card to assess the current state of labour community-owned infrastructure and possibly provide a "home" and a source of stable, predictable resources for stakeholder-driven other initiatives such as the renewal of the National Guide to Sustainable Municipal Infrastructure (InfraGuide) that was discontinued ten years ago.

CONCLUSION

ACEC looks forward to continued collaboration with the government and its stakeholder partners in developing the National Infrastructure Assessment. ACEC is in a position to serve within the leadership structure or working groups of the Assessment, convene industry leaders to provide expertise and feedback on the design of its governance and work to support a successful and green economic recovery from the COVID-19 crisis and beyond. ACEC welcomes the opportunity to work with the government to make this happen and stands ready to provide support in any form.

The Association of Consulting Engineering Companies – Canada (ACEC) is the national voice of consulting engineering firms in Canada. Our members are experts in infrastructure and are directly involved in delivering Canada's $126 billion commitment to infrastructure. ACEC is a federation of 12 provincial and territorial associations representing over 400 companies of all sizes that provide engineering and other professional services to both public and private sector clients across Canada. Collectively, ACEC member firms directly employ over 60,000 Canadians. Canada is globally recognized for its engineering services and Canadian-based firms are the second largest provider of engineering services in the world.

22nd Annual ACEC-MB Golf Tournament

On Wednesday, September 15, 2021 the ACEC-MB Golf Tournament returned after a year off. The 22nd Annual Golf Tournament took place at Bridges Golf Course, where 60 golfers came together (yet distanced) for a round of Texas Scramble, lunch, dinner, contests and prizes.

The day started out with a lunch sponsored by Stantec Consulting Ltd., that the golfers were able to enjoy while networking before Tee Off.

Beverages were enjoyed on the course and during dinner – thank you to our Beverage Sponsor ENG-Tech.

Our cart sponsor was once again TRI-CORE Projects Limited and this year sadly we golfed without Ron Duncan who passed away in October 2020. Ron will be sadly missed by ACEC-MB and the engineering community.

It was a very windy day on the course, but the sun came out to shine on the golfers as they chased hats and tried to hang onto everything. The wind didn't stop the tournament winners from getting in an excellent round of golf. The winning team from KGS Group finished with a score of 66. During the day golfers were also able to compete in 6 contests on the course. Congratulations to:

- Tournament winners: Matthew MacKay, KGS Group, Ivanka Waplak, MMP Architects Inc., Stephanie Champagne, MMP Architects and Sean Charles, KGS Group.
- Derrick Jensen – Longest Drive on Hole 1
- Matthew MacKay – Longest Drive on Hole 18 and Straightest Drive on Hole 8
- Ryan Harras – Closest to the Hole on 7
- Stephanie Champagne – Closest to the Hole on 15
- Todd Chudy – Straightest Drive on Hole 11.

Thank you to our Contest Sponsors for making these contests possible.

We also thank our Hole Sponsors: Canadian Concrete Pipe and Precast Association, Concrete Manitoba, Hatch Ltd., KGS Group, Nelson River Construction, PRO Engineering, Tetra Tech, Tower Engineering and WSP.

The day ended with a great dinner sponsored by Paddock Drilling, where everyone enjoyed some time to talk about the day and appreciate being in each other's company.

Golf Committee Chair David Fuchs, and Co-Chair Michelle Globush present the tournament winners with the trophy (left to right): Matthew MacKay, KGS Group, Ivanka Waplak, MMP Architects Inc., Stephanie Champagne, MMP Architects and Sean Charles, KGS Group.

Golf Cart Sponsor, TRI-CORE Projects Limited

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Use Paper Responsibly

Today's forest industry is working hard to become one of the greenest industries on earth.

Paper is an essential part of human civilization. While we all use and depend upon electronic communications, it is easy to ignore that it comes at an environmental cost. Worldwide spam email traffic creates greenhouse gases equivalent to burning two billion gallons of gasoline yearly, with numbers rising. More than $55 billion in toxic e-waste material is thrown away every year in the US alone, with a recycling rate of only 20% compared to 64.7% for paper.

No industry is perfect. But the paper industry has made, and continues to make, huge investments in environmental responsibility. Specifying and buying paper from certified sources ensures the continuation and growth of carbon absorbing forests. Using paper with appropriate amounts of recycled fibre helps preserve forests, conserve energy, and maximize fibre usage through paper lifecycles.

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