



REPORT FOR ACTION

Non-Competitive Contract with Code for Canada for the Development of a Data Platform for Traffic Collision and Volume Data

Date: November 18, 2019

To: Infrastructure and Environment Committee

From: General Manager, Transportation Services and Chief Purchasing Officer,
Purchasing and Materials Management Division

Wards: All

SUMMARY

The purpose of this report is to request authority to enter into a non-competitive contract with Code for Canada to hire a product team via Code for Canada to complete the development of MOVE, a new data platform to be used for the storage, visualization, and analysis of traffic volume and collision data, and bring it into production. In 2018, Transportation Services retained a team of three digital product professionals via the Code for Canada fellowship program to fundamentally rethink and redesign its processes and systems around traffic volume and collision data. The program produced an early prototype of MOVE and a detailed product roadmap built on a foundation of in-depth user research.

MOVE is being built to replace CRASH and FLOW, legacy software systems first deployed in the early 1990s:

- CRASH is used to store and analyze all recorded collisions involving a motorized vehicle that take place within the City of Toronto from 1985 to present.
- FLOW is used to store and analyze traffic counts conducted or commissioned by City staff from 1984 to present.

These systems are still relied upon today but have outlived their useful shelf lives and urgently need replacing. CRASH and FLOW are highly susceptible to data quality issues, are error prone, and use technologies and operate on systems that are no longer supported by the Information & Technology (I&T) Division. They also lack the features needed to support the planning and delivery functions of a modern and multimodal road safety program such as Vision Zero 2.0.

Collisions and traffic volumes are primary data sources used for engineering evaluations in support of traffic safety projects. These datasets are also critical to numerous transportation planning and operations functions across the City. This

contract would cover the delivery of product development services from a team of three associates over a period of up to 18 months. This work would also facilitate the publication of complete and timely traffic count and collision data to the City's Open Data Portal.

This is being executed as a non-competitive contract as Code for Canada is uniquely qualified to offer both product development services at a below market rate, help build internal digital capacity within the Transportation Services Division, and preserve institutional and project knowledge gained through past procurements with the organization.

City Council approval is required in accordance with Municipal Code Chapter 195, Purchasing, where the current request exceeds the Chief Purchasing Officer's authority of the cumulative five year commitment limit for each vendor under Article 7, Section 195-7.3(D) of the Purchasing By-law or exceeds the threshold of \$500,000 net of Harmonized Sales Tax allowed under staff authority as per the Toronto Municipal Code, Chapter 71, Financial Control, Section 71-11a.

RECOMMENDATIONS

The General Manager, Transportation Services and Chief Purchasing Officer, Purchasing and Materials Management Division recommend that:

1. City Council authorize the General Manager of Transportation Services to negotiate and execute a non-competitive agreement with Code for Canada to hire a product team via Code for Canada to complete the development of MOVE, in the amount of \$832,107.00 net of Harmonized Sales Tax (\$846,752.08 net of Harmonized Sales Tax recoveries) including provisional items, contingency and all applicable charges, on terms and conditions satisfactory to the General Manager, Transportation Services and in a form satisfactory to the City Solicitor.

FINANCIAL IMPACT

The total value of the non-competitive contract identified in the report is \$832,107.00 net of Harmonized Sales Tax (\$846,752.08 net of Harmonized Sales Tax recoveries). This includes \$53,900 in contingency.

Funding is available within the approved 2019 – 2028 Capital Budget & Plan for Transportation Services as summarized in Table 1.

Table 1 – Financial Impact Summary of Recommended Contract

Year	Cost Centre / Work Breakdown Structure Element	Cost Element General Ledger	Cost net of Harmonized Sales Tax Recoveries
2020	CTP717-58-45	4038	\$517,459.60
2021	CTP717-58-45	4038	\$329,292.48
Grand Total (Net of Harmonized Sales Tax Recoveries)			\$846,752.08

The Chief Financial Officer and Treasurer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

At its meeting of November 3 and 4, 2015, City Council endorsed the Congestion Management Plan (2016-2020), including a review and the development of strategies for modernizing and expanding traffic data collection efforts (e.g. pedestrian and bicycle counting) that are needed for traffic management and transportation planning functions:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW8.1>

At its meeting of July 12, 13, 14 and 15, 2016, City Council endorsed the Road Safety Plan (2017-2021) and endorsed in principle the 44 countermeasures identified within the supplementary report (July 11, 2016), including enhanced data collection, analysis, and reporting:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2016.PW14.1>

At its meeting of July 16, 17 and 18, 2019, City Council endorsed Vision Zero 2.0, an updated road safety plan for the City of Toronto that places an emphasis on data-driven decision making and prioritization:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.IE6.8>

COMMENTS

Code for Canada is a Federally-incorporated non-profit organization with a mission of improving policy and resident engagement, in part through building digital capability in government. They have championed a modern approach to building digital products that prioritizes user-centred design and agile development. Code for Canada has launched and currently operates numerous programs focused on bringing governments together with the technology and design community. These include a fellowship program that embeds digital professionals inside government teams, an inclusive and accessible usability testing service (GRIT), and a civic innovation hub (Civic Hall) for addressing

civic challenges using technology and design. They have also partnered with organizations at all three levels of government to build and advance key digital projects, leveraging the latest tools and processes in software development and user-centred design.

CRASH and FLOW are legacy software systems used in Transportation Services to manage collision and traffic volume data, two of the primary data sources used for engineering evaluations in support of traffic safety projects in the City. The CRASH and FLOW systems were first built in 1991 and urgently need replacing. The Vision Zero Road Safety Plan was adopted by City Council on July 12, 2016 and is one of the current Council's top priority items. An updated version of this plan, Vision Zero 2.0 (Report IE6.8), was adopted by Council on July 16, 2019. A key part of this plan is enhanced data-driven decision making, which is currently limited by the existing systems.

Access to reliable collision and traffic volume data and reporting is critical to the prioritization and evaluation of Vision Zero efforts. Vision Zero 2.0 places an emphasis on using data-driven decision making to inform the prioritization and evaluation of safety measures. Easy access to reliable collision and volume data, including tools and reports built on top of this data, is essential to the ability of staff to carry out this work. These datasets are also the bedrock on which transportation decisions across the City are built upon. Functional groups which rely on this data include signal operations, traffic operations, transportation planning, pedestrian and cycling projects, and many others.

User research conducted by Code for Canada over the past year has revealed that City staff are compensating for the shortcomings of the existing systems by investing significant manual effort into data cleaning and analysis tasks that would normally be automated. This research has also revealed that a wealth of data is being stored and maintained outside of these systems due to the restrictions of existing database schemas and proprietary software platforms, severely limiting the widespread availability of completed traffic engineering studies, duplicating staff effort and resources.

Code for Canada will be retained to continue to develop MOVE and transition it from a working prototype to a fully productionized solution. This procurement will cover the services of three technical professionals ("associates") to transition a working software prototype, MOVE, and deploy it to production over the course of eighteen months slated to commence in February 2020. This transition will also include the retirement of the existing CRASH and FLOW systems. The team will consist of three associates: a Product Manager, a Technical Lead / Developer, and a Design Lead.

Code for Canada will be responsible for candidate recruitment and will also act as coaches and mentors for both the product team and for Transportation Services staff. They will continue to help the Division build internal capacity in digital product development in partnership with the Information & Technology (I&T) Division. The team of three associates will be embedded within Transportation Services' Data & Analytics unit for the term of the contract.

In October 2018, Transportation Services brought in a team of three fellows via the Code for Canada fellowship program to build a prototype to replace CRASH and FLOW. The fellows were given a mandate to investigate and reimagine the processes and systems, from data entry to analysis, that underpin CRASH and FLOW.

The fellowship program produced an early data platform prototype, MOVE, and a detailed product roadmap built on a foundation of in-depth user research. The first stage of development focused on traffic warrant processes and on significantly improving the ability of City staff to identify the need for and request new traffic data. This was informed by a wealth of user research sourced from interviews and workshops conducted by the Code for Canada fellows with City staff from functional groups across Transportation Services as well as within the Toronto Police Service, City Planning, I&T and City Clerks.

While the fellowship program concluded on August 2, 2019, the contract was amended to allow a new team of associates from Code for Canada to continue mapping out a fully functional prototype for an additional 4 months until February 2020, when it is proposed that this new contract contemplated here would commence. This approach allowed the City to carry forward significant institutional and project knowledge from the fellowship over to future development work while scoping the requirements for this procurement.

Like work conducted on the prototype to-date, MOVE will continue to be built using agile development practices. Prioritizing development based on user feedback rather than upfront requirements requires that the scope of the project is subject to change over the term of this contract. The current product development team has prioritized the development of the following features over the 18-month term of this contract:

- A flexible, map-based interface to allow staff to explore collision and volume data;
- Robust corridor and area multi-location data so that Traffic Operations staff can produce automated reports and efficiently identify warrant feasibility;
- A rebuilt back-end database for traffic collision and volume data to ensure the integrity and reliability of this data for all user groups;
- The ability for the Toronto Police Service to update collision data and receive more accurate data from the Collision Reporting Centre, resulting in actionable information for Vision Zero staff;
- An integrated traffic count request and reporting system for Traffic Operations staff that is not reliant on external applications, resulting in significantly reduced manual effort and risk of human error;
- A study request queue for data collection staff, facilitating process-automation and eliminating the need for manual reporting to manage vendors;
- Customized reporting for Traffic Operations staff tailored to specific transportation use cases, eliminating the need for manual report creation in Microsoft Excel;
- Automated traffic volume and collision import and validation processes, eliminating the need for manual checks and data transfers;
- Automated data processes that feed in to the City's Open Data Portal, making timely and disaggregate traffic volume and collision data widely available to the public; and
- The ability for Data Collection staff to import traffic volume data from alternative sources.

These features will be supplemented by the continued improvement of existing features as additional findings surface during user research.

Code for Canada will assist Transportation Services in transitioning skills in-house to maintain and support MOVE together with I&T. MOVE is being built as a set of independent modules using modern, cloud-based, corporate I&T-supported platforms and systems. This will facilitate the continued development of new features as needed while minimizing maintenance efforts. Unlike many off-the-shelf or legacy software applications, including CRASH and FLOW, this will allow the City to contract out new features or maintenance as small, competitive procurements or through in-house development.

The fellowship program and subsequent contract amendment have been used as pilots for a new method of IT system procurement focusing on agile and iterative development and human-centered design. Code for Canada will continue to act as coaches and mentors for both the product team and for Transportation Services, continuing to help the Division build internal digital capacity in product development and helping to facilitate a close working relationship with I&T.

This contract has been signed off through the Information Technology Authorization Procurement Plan (ITAPP) process which reflects the commitment of both the Transportation Services and I&T divisions to work together on completing the MOVE platform.

As part of this agreement, the City will maintain ownership over the intellectual property and all of MOVE's source code. This serves not only to ensure that the City can make modifications and/or enhancements to the product in the future without reliance on a third-party, but also that the City is free to make MOVE an open source software. City staff can, and intend to, release source code publicly and benefit from any future improvements or features built by other public or private sector organizations.

The contract value specified in this report reflects costs that are limited to the salaries earned by the three associates and related overhead costs (i.e. hiring, payroll administration, training and development, etc.) incurred by Code for Canada. A critical benefit unique to this agreement is that it allows the City to build digital product development capacity in-house, a by-product of Code for Canada's emphasis on working collaboratively with government partners and its mission of building digital capacity in government (see Building In-House Capacity). The equivalent all-in hourly rate for these services is \$101.60/person-hour, significantly less than comparable rates offered by other external consultants or vendors.

Two alternatives were identified to the proposed non-competitive agreement with Code for Canada; first, using a competitive request for proposal (RFP) process or second, leveraging internal I&T resources to continue project work. For the first alternative, Transportation Services staff, in consultation with PMMD, recommend against a competitive procurement process as this has been estimated to be significantly more expensive and will necessitate a longer overall procurement process. The second alternative would require continuing to develop MOVE using internal resources provided

by I&T. While this option would be cost competitive with the option recommended in this report, it would require substantial changes to the project team and a shift in overall direction, including delays resulting from knowledge transfer and project initiation. Transportation Services will continue to work closely with I&T and leverage its resources to ensure MOVE is built using technologies and processes that facilitate its long-term sustainment.

This non-competitive agreement allows the City to retain members of the current product team, allowing the City to ensure the preservation of institutional and project knowledge moving forward. The non-competitive agreement will also allow Transportation Services to continue their working relationship with Code for Canada, a non-profit organization that has supported multiple City divisions as well as other Canadian government agencies to modernize digital practices.

The Fair Wage Office has reported that Code for Canada has indicated that it has reviewed and understood the City of Toronto's Fair Wage Policy and Labour Trades requirements, and has agreed to comply fully.

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SIGNATURE

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