



To: Board of Management

From: Robin D. Hale
Chief Operating Officer

Subject: **MAGNOVATE TRANSPORTATION INC. – UNSOLICITED PROPOSAL**

Date: 2016-03-27

Summary:

This report reviews an unsolicited proposal received from Magnovate Transportation Inc. (Magnovate) to construct a demonstration and fully functional Maglev (Magnetic Levitation) train ride on the site of the original Domain Ride route at the Toronto Zoo and recommends approval for staff to proceed with a formal “Swiss Challenge” to the proposal.

Recommendations:

It is recommended that:

- 1. The Board approve, in principle, the concept related to a demonstration and fully functional Maglev (Magnetic Levitation) train ride at the Toronto Zoo, as outlined in the unsolicited proposal received from Magnovate, subject to:**
 - a. The Magnovate submission being selected as the successful proposal following completion of a formal “Swiss Challenge” process;**
 - b. Proof that Magnovate has secured full financing for the project and assurances that all funding requirements for the proposed project will be on a net zero basis to the Board, and the City; and,**
 - c. Negotiation of the terms of an agreement acceptable to the Board;**
- 2. Staff be directed to proceed with a formal “Swiss Challenge” process, in consultation with the City of Toronto Purchasing and Materials Management Division (PMMD) and the City Solicitor, and issue a Request for Proposals (RFP) to determine the extent of the competitive market to ensure transparency, fair competition, and best value for the Toronto Zoo in relation to the unsolicited proposal from Magnovate Transportation Inc. (Magnovate);**
- 3. Based on the evaluation team review of any submissions to the RFP, in accordance with Toronto Zoo Policy FIN-008, staff provide Magnovate with an opportunity to match any competing proposals determined to be superior to its original unsolicited proposal;**

- 4. Any other proponent considered for the project as a result of the “Swiss Challenge” process be required to meet the same conditions expected of Magnovate in Recommendation 1 a), b), and c);**
- 5. Staff report to the Board of Management on the results of the RFP and “Swiss Challenge” process and submit further recommendations for approval, as necessary.**

Financial Impact:

There is no financial impact as all required costs are to be funded by the Proponent. However, there is significant revenue potential for the Zoo if successfully implemented.

Background:

An unsolicited proposal was originally received from Magnovate Transportation Inc. in May 2014. Since that time, a considerable amount of work has been done to develop further detail related to the proposal. Magnovate was founded to commercialize Magline, a proprietary magnetic levitation (maglev) powertrain platform that enables a whole new generation of advanced transit systems. They are the epicentre of a consortium that includes several multi-billion dollar international industrial leaders who are all committed to creating a complete maglev transportation industry in Canada. The consortium includes Lockheed Martin, PCL Construction, Stantec Engineering, and Magna International. The technology is a breakthrough development of maglev (magnetic levitation) propulsion. It is a silent, frictionless and highly energy efficient powertrain that can run without recourse to carbon-based fuels. Solar panels mounted on stations and on other elements of the infrastructure can supply much of the system’s day-to-day power requirements.

As part of the commitment to further maglev transportation options in Canada, Magnovate researched possibilities for the optimal location to create a demonstration site to exhibit the technology. As such, Magnovate determined that the original Domain Ride (also referred to as the “monorail”) route and guideway at the Toronto Zoo would be a suitable site for this purpose and ultimately for showcasing a fully functional Maglev (Magnetic Levitation) train ride. Although the costs to retrofit the original monorail tracks and guideway are significant, it would efficiently utilize an existing infrastructure to avoid the additional incremental costs to construct a completely new system.

Magnovate commissioned an independent guideway inspection that was performed by Stantec Engineering and its experts concluded that the existing structure had remained in very good condition and there has been minimal deterioration since the original monorail system was decommissioned. This is due in part to the fact that the structure has not been exposed to severe elements, such as salt, that are a major cause of accelerating roadway and bridge deterioration in the winter months.

Comments/Discussion:

There is much external interest in Magnovate from various investors and funding agencies, most notably Sustainable Technology Development Canada (STDC), the consortium partners, and capital financing entities in order to create a lower-speed Maglev system that emulates the high-speed examples in Shanghai, China and Linimo, Japan. The total amount of the project to Magnovate and their investors would be approximately \$25.0 million, with no funding requirement from the Toronto Zoo or the City of Toronto.

The Magnovate collaboration with the Toronto Zoo would ultimately result in a Maglev Ride on the Zoo site that will not only serve as a prime site for Magnovate to exhibit the technologies, but would also create a new attraction for Zoo visitors to ride first commercial maglev transit system in North America. This will serve to improve mobility options at the Zoo and would be an opportunity for demonstrating sustainable technologies. It is notable that the Magnovate proposal includes a detailed overview on the safety and redundancy features of the maglev system, which is of significance, due to the emphasis and importance of safety at the Toronto Zoo.

Subject to the results of the “Swiss Challenge” process and Board approval, the project involves three (3) phases over a thirty-three (33) month period. A pre-requisite to starting work on the project would include any environmental approvals, and of course, the guarantee that all external financing has been secured as recommended. The first phase spans fifteen (15) months and includes development of full-scale test vehicle with a fully functional maglev suspension, low-power linear motor, digital control system, and off-board power supply. The test vehicle would be tested continuously along with the switching equipment over a twenty (20) meter section of track to ensure all aspects of stable levitation during acceleration, deceleration, and transition through the switch was assured before advancing to Phase 2.

Phase 2 spans twenty-four (24) months and includes the manufacture of twelve (12) production vehicles for testing on the Phase 2 track. The vehicles will include the same operational features as the Phase 1 vehicle but will use production quality materials and components. Passenger cabins will include full amenities, including HVAC and an information / entertainment system. The traffic control system will also be deployed and tested on the Phase 2 track.

The final phase of the project (Phase 3) involves working with the Technical Standards and Safety Authority (TSSA) over a seven (7) month period to obtain safety certification prior to commercial operations. Magnovate is fully aware of the need for full assurances in relation to the long-term safety requirements of the system.

Once operational, Magnovate proposes that it would operate the system for a period of five (5) years and share the **net** revenues with the Toronto Zoo on a 50/50 basis after operating and financing costs. At the end of the 5 year period, Magnovate would turn all of the equipment over to the Toronto Zoo and would continue to maintain the system and equipment on a service agreement basis. However, any operating expenditure implications will be further assessed in a detailed cost / benefit analysis and will be subject to negotiation of an agreement acceptable to the Board.

Based on the expression of interest by Magnovate in proposing the Maglev project at the Toronto Zoo, it is recommended that the Board approve the recommendation to proceed with the “Swiss Challenge” process. This will enable Magnovate to proceed with the STDC application requirements and aligning other financing partners at no risk to the Board. It is currently anticipated that staff will be in a position to report back to the Board on the results of the “Swiss Challenge” process and recommend next steps at the meeting scheduled for June 2, 2016.

R. D. Hale
Chief Operating Officer

List of Attachments:

Appendix I – Magnovate Proposal

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