



INFORMATION REPORT

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	June 19, 2017
SUBJECT/REPORT NO:	Escarpment Rehabilitation & Strategy Plan (PW16048a) (City Wide)
WARD(S) AFFECTED:	City Wide
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SIGNATURE:	

Council Direction:

At the May 30, 2016 Public Works Committee meeting, staff were asked to report back on the following;

- That a wall assessment with additional rehabilitation works be considered for the Kenilworth Access and be highlighted for possible inclusion in the 2017 Budget; and,
- That as part of any rehabilitation work to the Escarpment, staff be directed to investigate the feasibility of measures on how to mitigate the “visible pollution” associated with these types of work so as not to take away from the natural beauty of the Escarpment.

Information:

The intent of this report is to address the previous Council direction and provide an update on the Public Works Department’s ongoing maintenance and planned capital works for the escarpment traffic access corridors.

The City of Hamilton has a total of 17 escarpment traffic access corridors which are located in close proximity to natural slopes or steep rock cuts:

- ❖ Fifty Road
- ❖ McNeilly Rd
- ❖ Dewitt Rd

OUR Vision: To be the best place to raise a child and age successfully.

OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.

OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.

- ❖ New Mountain Rd
- ❖ Centennial Parkway
- ❖ Kenilworth Access
- ❖ Sherman Cut (East & West Leg)
- ❖ Claremont Access
- ❖ Jolley Cut
- ❖ James St S / James Mountain Rd
- ❖ Queen St / Beckett Drive
- ❖ Wilson St
- ❖ Old Dundas Rd
- ❖ Highway 8 (Dundas)
- ❖ Sydenham Rd
- ❖ Red Hill Valley Parkway

Public Works has retained geotechnical and civil engineers to assess the condition of the slopes, road platform and wall systems. Based on these assessments along with staff's field inspections, a maintenance and rehabilitation program has been identified. The program includes priority capital work as well as annual maintenance.

The assessments completed to date are high level visual assessment and provide the City with critical works that need to be completed within the next 10 years. The outcomes of these assessments, for the near-term projects, are summarized in the following section of the report. Subsequent studies based on lifecycle needs will be required in order to confirm an escarpment access strategy. In addition, detailed design studies will be required to implement future projects.

ESCARPMENT ACCESS CAPITAL WORKS

❖ Claremont Access

In the fall of 2016 during the vegetation removal above the steel facing walls on the Claremont Access, a failed section of steel wall was discovered. It ultimately prompted the City to close the down bound lanes on the Claremont Access due to safety concerns. Due to this failure a detailed assessment was carried out to establish the following short term remedial actions:

1. Removal of 1091m² steel panels of bin walls
2. Installation of tie-back anchors and ropes to support the critical remaining wall panels

3. Installation of a 300m rock fall protection barrier adjacent to the down bound lanes at the toe of the slope

The estimated total cost of this mitigation work was \$1.35 million. With the above mitigation measures in place, the City re-opened one down bound lane to traffic in February 2017. Nevertheless it should be noted that there is a continued risk of future rock fall, as with any exposed rock cut. However, based on a geotechnical review it was concluded that the current mitigation measures combined with continued monitoring and rock scaling will provide sufficient risk mitigation for the next 3 to 5 years.

As previously indicated, short term mitigation recommendations have been addressed through the recent and ongoing work facilitated by the City's Roads Operations Division. However, within the next 3 to 5 years the City will endeavour to address and or mitigate the geotechnical engineers' intermediate and long term recommendations. Additional detailed investigations will be carried out in order to determine the long term slope stabilization and rock fall protection solutions for this access. Staff will undertake this investigation later this year with the intent of including the capital works in the 2018 capital budget.

As with any slope of this type the city can either address the condition that causes the rock to fall or mitigate the impact of the falling rock. In addition, the continued movement of the steep face back to a more stable slope must also be addressed. The long term mitigation measures for the Claremont slope/face must address three major components; capital cost, aesthetics and maintenance. Staff will be developing options and assessing them against these criteria. For example, a wall or series of walls may have a lower initial cost but there will be finite life, continued maintenance and there will be a negative aesthetic impact. Cutting the slope or creating a series of terraces, while more sustainable and aesthetically pleasing, will require additional property along the brow. These options need to be further vetted with regard to potential liabilities, approval requirements and a firm cost comparison over the life cycle term.

❖ Sherman Access

The needed Sherman Access West leg road support deficiencies will be addressed by capital works that are scheduled to be completed in 2017. This work includes replacement of 3 existing retaining walls, as well as the construction of 4 new retaining wall sections where areas of slope stability concerns have been identified. The total cost of this project is estimated at \$2.5 million.

Recommendations for similar works along the Sherman Access East Leg will be presented in the future capital budget process.

❖ Fifty Road

Capital works are tentatively scheduled in 2022. This planned work includes road re-construction, stabilization of slope, and reconstruction of new retaining wall. The total cost of this project is estimated at \$2.5 million

ESCARPMENT ACCESS MAINTENANCE & MONITORING

Road Operation Division retained a geotechnical engineer to complete visual inspections of the rock slopes on all the escarpment accesses. This study included visual assessments of the exposed rock conditions, identification of potential rock fall hazards, mapping of relevant features of the slopes, and an assessment of the potential failure modes.

This study also provided recommendations for the maintenance work required along with a suggested priority for this work. The recommendations of this report were presented by the Operations Division as part of Report PW16048. Staff plans to address the recommended maintenance work as per the priority identified in the report. An increase in the Escarpment Stabilization Fund to a total \$1.0 million per year has been included in 2018 as well as future years in order to address these maintenance needs.

An annual monitoring program will be put in place to monitor the accesses in order to program maintenance activities such as rock scaling and slope remedial measures.

SUMMARY

City staff have recently updated the condition assessments of the escarpment accesses within the city. The outcomes of these assessments have been utilized to develop a proactive work program containing recommended capital and maintenance works. A summary of the recommended works for the next 10 years has been included in Appendix "A". These works identified in the appendix will be incorporated into the City's 2018 Capital Budget for Council's consideration.

In addition, staff will complete further studies in order to confirm the intermediate and long-term projects to be incorporated in future capital budgets.

The rock faces, slopes and retaining structures of escarpment access represent a large component of future risk and liability in terms of both the assets and use of the facility. These roads continue to age but unlike their corresponding local or arterial roads, have often more high profile issues. Rock falling on the road, land above the cut and the potential for wall systems to fail without prior indication, despite regular inspections, are all issues that must be considered and resolved in any long term sustainable approach to the management of these assets.

Appendices and Schedules Attached

Appendix A: Recommendations