

**Report to/Rapport au :**  
**Environment Committee**  
**Comité de l'environnement**  
**and Council / et au Conseil**

**January 3, 2013**  
**3 janvier 2013**

**Submitted by/Soumis par :**  
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ORLÉANS (1)

Ref N°: ACS2013-CMR-OCM-0001

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**SUBJECT: ROOT CAUSE ANALYSIS OF SEPTEMBER 4, 2012 HIGHWAY 174 STORM SEWER PIPE COLLAPSE**

**OBJET : ANALYSE DES CAUSES FONDAMENTALES - AFFAISSEMENT DE LA CHAUSSÉE SUR L'AUTOROUTE 174 LE 4 SEPTEMBRE 2012**

**REPORT RECOMMENDATION**

**That the Environment Committee recommend Council receive this report for information as supplemental to the 2013 rate budget.**

**RECOMMANDATION DU RAPPORT**

**Que le Comité de l'environnement recommande au Conseil de prendre connaissance du présent rapport en tant que document complémentaire au budget de 2013 soutenu par les tarifs.**

**EXECUTIVE SUMMARY**

On September 4, 2012, while undergoing preparatory work to make structural repairs, a section of storm sewer pipe collapsed under the southern exit ramp of Highway 174 near Jeanne D'Arc Boulevard. Immediate measures were undertaken to stabilize the site and implement emergency repairs.

On September 12, 2012, Council directed the City Manager to:

*“Initiate an independent, arms-length, review of the root cause of the Highway 174 sinkhole and determine what, if anything, the City could have done differently to prevent the sinkhole and the subsequent failure of the east bound lanes of Highway 174 and report back to the Finance and Economic Development Committee within 90 days.”*

Additionally, Council directed that the City Manager:

*“Undertake an immediate review of any similar pieces of City infrastructure located in and around our critical City streets (i.e. any critical infrastructure similar in age or materials to the pipe that failed under Highway 174) and that this work be completed no later than September 30<sup>th</sup>.”*

On November 28, 2012, Council further directed that staff:

*“Re-direct the consultant’s report on the independent, arms-length, review of the root causes of the Highway 174 sinkhole and subsequent failure of the eastbound lanes of Highway 174 to the Environment Committee; and that the consultant’s report be publicly released on or before December 12, 2012, to ensure it is available within the 90 days as directed by Council in addition to the release that will occur with the January Agenda for the Environment Committee.”*

Pursuant to Council direction, the analysis of critical infrastructure was completed and reported to Council on September 28, 2012.

Additionally, as per Council direction, a statement of work was drafted to undertake the root cause analysis of the storm sewer pipe collapse. Recognizing that the successful proponent had to specialize in drainage and possess structural, soils and hydrology expertise coupled with a requirement to ensure that the proponent had not performed work for either the City or any of the contractors associated with the work being performed on the Highway 174 storm sewer pipe, staff consulted with the Chief Executive Officer of the Consulting Engineers of Ontario and the President of the Drainage Superintendents of Ontario to obtain input regarding suitable firms to undertake such a review. To ensure that the review was undertaken within the timeline specified by Council, five firms were identified and contacted to submit proposals in response to the statement of work (Document 1, Appendix A, to this report). Based on the submissions, B.M. Ross and Associates was retained to undertake a root cause analysis of the incident and prepare a report with recommendations. B.M. Ross and Associates has the pre-requisite technical expertise and has not previously worked for the City, the contractor or the consultant working on the Highway 174 storm sewer pipe repair project.

A Technical Briefing was held for Members of Council on December 7, 2012, at which time the results of the independent review were released to the public. The purpose of

this report is to present the findings and recommendations of the independent review and outline the actions undertaken or planned by the City in response to those recommendations related to the management of critical storm sewer assets.

B.M. Ross and Associates found that Ottawa's practices were similar to those of the peer municipalities that were consulted as part of the review. Their independent review identified five recommendations aimed at strengthening current asset management practices. Staff concur with all of the recommendations contained in the consultant's report and outline the measures already in place or underway which respond to these recommendations and that will assist in improving asset management practices at the City.

## BACKGROUND

On September 4, 2012, a 3.6 metre (m) diameter storm sewer pipe crossing Highway 174 at Jeanne D'Arc Boulevard collapsed creating a large sinkhole and closing the eastbound lanes. The City immediately coordinated an emergency response involving several City departments, including Infrastructure Services, Public Works, Transit Services, Environmental Services and Ottawa Police Services, to close the roadway and replace the pipe. The City then implemented interim measures to mitigate traffic pressures resulting from the road closure. By implementing a 24-hour response by staff and the contractor, the road was reopened to the public on September 17, 2012.

On September 12, 2012, Council directed the City Manager to initiate an independent, arms-length review of the root causes of the Highway 174 sinkhole and report back within 90 days, to the Finance and Economic Development Committee with findings and recommendations to be implemented that would reduce the risk of a reoccurrence.

Pursuant to Council direction, the firm B.M. Ross and Associates was retained to undertake a root cause analysis of the incident and prepare a report with recommendations, where warranted. This firm was selected after obtaining input from the Chief Executive Officer of the Consulting Engineers of Ontario and the President of the Drainage Superintendents of Ontario regarding suitable firms to undertake such a review. B.M. Ross and Associates was also selected based on the fact that it had not previously done work for the City, the contractor or the consultant working on the project.

On November 28, 2012, Council directed that the consultant's report on the Highway 174 sinkhole be brought to Environment Committee, rather than to the Finance and Economic Development Committee.

The purpose of this report is to present the findings and recommendations of the independent review and outline the actions undertaken or planned in response to the consultant's recommendations regarding the management of critical storm sewer assets. It is also intended to report on the delegated authority exercised by senior

management in responding to this emergency situation. The report prepared by B.M. Ross is included as Document 1 to this report.

### State of Storm Sewer Assets

The City owns over \$8 billion in sewer assets (based on replacement value) including 2,600 km of storm sewer pipes and 2,700 km of sanitary and combined storm sewer pipes. These assets exist to support the delivery of services to the residents of Ottawa that are important to our quality of life.

Much of the City's infrastructure was created to support growth as the City's urban area expanded to include suburban areas, and to service rural communities. This infrastructure requires continued investment to ensure it is kept in good working order. It is an emerging industry best practice to develop comprehensive asset management programs to help prioritize these investments and ensure best value for taxpayer dollars.

On October 10, 2012, Council approved the Comprehensive Asset Management (CAM) Program (Ref N<sup>o</sup>: ACS2012-PAI-INF-0007). This report included approval of a program and associated target funding policy needed to keep the City's infrastructure in a state of good repair. At the heart of the program is a framework aimed at making sure the City targets the right infrastructure renewal investments at the right time. To achieve this, the report recommended Council adopt new levels of service that take a risk-based approach to investment decisions.

Applying a risk-based approach to the City's sewer systems recognizes that not all pipes present the same risk to service. Risk is defined as the likelihood and consequence of failure. Likelihood of failure is a function of pipe material, operating environment, construction practices and remaining service life prediction. Consequence of failure is a function of the extent to which a service would be impacted by a failure, the location of the pipe (for example under a busy transportation corridor) and size as this could affect the time to reinstate a failure. The intent of a risk-based approach is to allocate priority for inspections and funding to those assets that present a higher risk to service.

The CAM report included a State of the Asset Report (Document 1 to report Ref N<sup>o</sup> ACS2012-PAI-INF-0007). The report contained a comprehensive look at the physical condition of the City's assets. Overall, it concluded that the City's assets are in fair to good condition and are not in a state of disrepair, but it is recognized that the condition of the assets is gradually deteriorating and investments, beyond previous levels, are required to sustain them into the future.

As reported in the State of the Asset Report, on average, storm and sanitary sewers are rated as between fair and good condition. The State of the Asset Report also shows the distribution of condition grades ranging from very good to very poor. Having a distribution across all condition grades is part of a good asset management approach. The challenge is not allowing assets in poor and very poor condition to increase to the

point where they become unmanageable or where they become a high risk to service (for example there would be a higher tolerance to having small sewer collection pipes in poor to very poor condition than there would be with a large sewer servicing a large area with sections crossing under major transportation corridors).

The City maintains an extensive inventory of its sewer systems tracking location, size, material, age, depth, condition and soil environment. Each of these elements presents a different risk profile. No one pipe material is appropriate for all situations and the objective is to install the material that will provide the best performance over the expected service life.

As observed in Figure 1, the majority of sewer pipes are less than 1 m in size with less than 1 per cent (approximately 20 km) being 3 m or greater in size. Figure 2 shows the length of sewer pipes by material. As can be seen, concrete and plastic comprise nearly 90 per cent of the pipe material and metal sewers account for approximately 1 per cent (65 km of all types of metal pipes combined) of the overall network of sewer pipes.

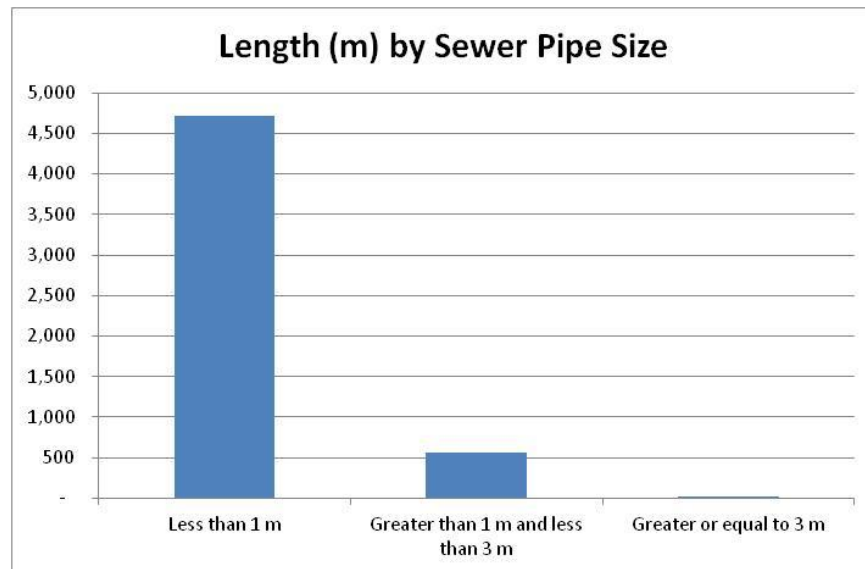


Figure 1 – Length of Sewer Pipes by Size

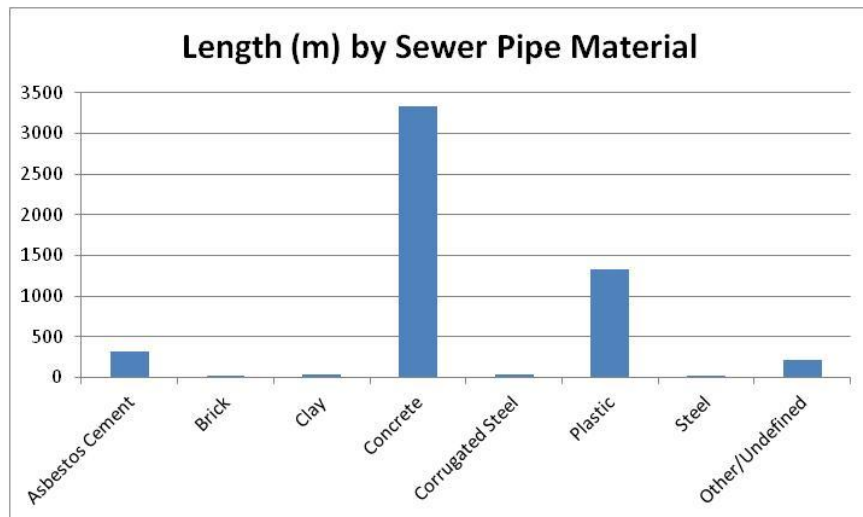


Figure 2 – Length of Sewer Pipes by Material

## DISCUSSION

### Storm Sewer Pipe Collapse

Prior to the collapse that occurred on September 4, 2012, an inspection of the storm sewer pipe was carried out in August 2011. Based on the closed circuit television (CCTV) video inspection, staff identified a section of pipe under the eastbound lanes of Highway 174 to be in poor to very poor condition, and immediately identified the need to have the pipe lined. At this time, staff did not believe the pipe was in a state of imminent failure and expected that there was sufficient time to undertake the design and contract preparation for the lining of the pipe.

Following the collapse, it was evident that the deterioration of the pipe had accelerated beyond what was anticipated. The independent review undertaken by B.M. Ross concluded that, based on the CCTV inspection, the pipe, although not at risk of imminent failure, warranted follow-up actions including an immediate visual inspection. The independent review also concluded that the contractor's construction activities likely "influenced the timing of the collapse" on September 4, 2012.

### Cost

Originally, the pipe relining project cost was estimated at \$1.7 million. On September 12, 2012, senior management reported to Council that the emergency repair cost estimate was an additional \$3.2 million, bringing the total estimate to \$4.9 million, including the section to be relined under the westbound lanes, as originally planned. This figure excludes the additional costs incurred by other departments in responding to this event, such as traffic and transit costs, as these were not known at the time.

The final cost of the repairs to the storm drainage pipe is \$4.5 million. This figure includes \$4.2 million in Infrastructure Services costs (\$2.7 million for the emergency

repair and \$1.5 million for the relining of the section of pipe under the westbound lanes) and \$0.3 million in increased operational costs across those departments assisting in managing the emergency during the repairs. Procuring and replacing such a large pipe on an expedited basis required Infrastructure Services staff and the contractor to work non-stop until the pipe was replaced. It also required significant collaboration between City departments to coordinate efforts to mitigate the impacts of the road closure on the travelling public.

The additional cost associated with the emergency repairs was funded through the reallocation of sewer funds from other projects that had been deferred, as identified in the *Update on 2012 to 2014 Infrastructure Renewal and Cycling Programs Facilitated by Ottawa on the Move* report (Ref N<sup>o</sup>: ACS2012-PAI-INF-0011) approved by Transportation Committee on November 7, 2012. This event reinforces the cost effectiveness of applying the right renewal intervention at the right time. This approach is cost effective in terms of both direct repair costs and the unquantifiable costs to the community of an unplanned disruption.

### Independent Review

Staff concurs with the findings of the independent review undertaken by B.M. Ross and Associates (Document 1 to this report). The review provides an opportunity to understand what led to the failure and what measures can be implemented to reduce the risk of a reoccurrence, not only for buried infrastructure but also other critical infrastructure assets.

The independent review recognizes the uniqueness of this specific event. While it remains impossible to mitigate all risk of potential failures, the likelihood of a reoccurrence is very low and ongoing improvements to the City's asset management practices will further reduce the risk of a reoccurrence of this type of event.

The storm sewer pipe that collapsed on September 4, 2012, was constructed in approximately 1975 as part of the development of the Convent Glen Storm Drainage Works, as shown in Figure 3.



Figure 3 – 3.6 m Diameter Storm Sewer

This pipe was installed by the developer, following the former Township of Gloucester's development control process, and crossed what was then provincial Highway 17, which was a two-lane highway at the time. The approved drawing, and the subsequent as-built drawing, identified the pipe material as corrugated steel pipe (CSP) with the section under the two-lane former provincial highway as being tunnelled using a liner plate made of hot dipped galvanized steel with cement grouted on the exterior of the pipe and an asphalt coated bottom. A liner plate is a metal pipe that is assembled in the field in sections as the opening is being tunnelled under the roadway. That method of construction would have been selected to avoid having to close the road to allow the pipe to be installed using an open excavation.

The B.M. Ross report indicates that the material that failed on September 4, 2012 was not as identified on the original approved drawings which were prepared following the pipe construction (i.e. not galvanized, not cement grouted and not asphalt lined at the bottom) and deteriorated at a faster rate than the rest of the storm sewer pipe. Given the limited available historical information, it is not clear what led to this discrepancy in the records. Recent inspections have shown that the rest of the pipe under the westbound lanes is in relatively good condition.

On September 12, 2012, staff was also directed to undertake an immediate review of all similar types of City infrastructure located in and around critical locations. This review was completed and the findings provided to the Mayor and Members of Council in a memo dated September 28, 2012. The follow-up investigation resulted in accelerating the schedule to line two other storm sewer pipes crossing Highway 174 (one west of Montreal Road and the other west of Orleans Boulevard). The contract to line these



pipes has been awarded and the work is scheduled to be completed by the end of January, 2013. Staff retained a consultant to undertake a structural and corrosion assessment of these pipes and both were found to be safe. Staff will continue to monitor the condition of the pipes until the lining has been completed.

In general, the independent review found that Ottawa's practices were similar to those of the peer municipalities that were consulted as part of the review. The independent review provides recommendations to improve current practices to reduce future risk of a failure. Staff concurs with all of the recommendations in the review and a number of actions have been taken or are underway to assist in improving asset management practices.

It is noted that the recommendations of the independent review are consistent with the CAM Program recently approved by Council. The CAM Policy includes a number of policy statements with respect to how assets are to be managed, including balancing value against affordability, applying the right intervention at the right time, employing a risk-based approach and continuous improvement.

The following are the five recommendations of the independent review and an overview of actions taken or underway in relation to the recommendations:

- 1. *The current definition of a high-risk storm sewer asset (i.e. trunk sewer) should be expanded, as envisioned in the recently adopted Comprehensive Asset Management Program, to include consideration of the probability of failure as well as the consequence of failure.***

This recommendation is consistent with the approved approach that informs the City's Comprehensive Asset Management Program, which increases the focus on higher risk assets, such as large watermains, to ensure the level of risk is understood and inspection practices are aligned recognizing those risks. The refinement and expansion of definition of high-risk was underway prior to the collapse.

This approach was used to assess the City's inventory of large watermains and the protocols and processes continue to be refined with respect to other subsurface infrastructure like storm sewers with a view to assessing the likelihood and consequence of failure. This assessment will look at factors such as type of pipe, material, age, expected service life, corrosive soils and operating environment. The assessment will also consider factors such location (critical transportation corridors) and impact on service (flooding) in the event of a failure. This approach will assist in identifying the need to put in place mitigation measures, including increased inspections to monitor the progression of deterioration for more critical infrastructure assets.

- 2. *Those storm sewer assets designated as high risk – beyond those that have been assessed following the event in question – be examined as soon***

***as possible and all these examinations be reviewed by persons qualified to assess the condition and judge the need for further action.***

Staff conducting sewer condition assessments include technologists and engineers working under the responsibility of a qualified Senior Engineer. These individuals are experienced and trained to apply recognized international pipeline assessment practices based on CCTV inspections. Recognizing the limitations of CCTV inspections for metal sewers, the use of external consulting services has been increased to enhance condition assessment practices, where warranted, to undertake specialized structural and corrosion inspections. This practice will provide the ability to more definitively identify further actions and the associated timelines that may be required to maintain the integrity of these sewer assets.

In addition, as acknowledged in the consultant's report, staff is working on refining the risk assessment for the City's storm sewer system to ensure that inspection practices are aligned with the risks related to critical sewer assets. This work is being led by Infrastructure Services in conjunction with Environmental Services to ensure there is an ability to leverage staff expertise in both departments. For critical assets, the approach includes leveraging existing and emerging inspection technologies and retaining expertise to supplement the City's condition assessment practices.

- 3. That an attempt be made to assess the quality of the information in the City's storm sewer asset inventory. Where there are weaknesses related to the inventory's source material or as determined from observations, an effort to improve the data should be made.***

The City's storm sewer inventory data is based on the best available information recognizing the infrastructure has been built over many decades. Improving the quality and reliability of the City's asset inventory data is an ongoing process. Procedures have been enhanced to verify the accuracy of asset data related to the acceptance of new infrastructure into the City's inventory. The risk assessment process will refine the identification of critical sewer assets and a data validation process will be undertaken to confirm the reliability of the information. Ongoing sewer inspections and the implementation of a new Enterprise Asset Management (maintenance management) system will also provide an opportunity to improve inventory data going forward.

- 4. With full consideration of safety issues, and where feasible, physical inspections be used to supplement CCTV inspections for high risk assets.***

Staff in Infrastructure Services and Environmental Services continue to work collaboratively to refine inspection practices, including physical inspections. For example, in the case of corrugated steel storm sewer pipes, assessment practices have been amended to include a more detailed physical assessment to supplement CCTV inspection information. As previously noted, this practice has

already been applied to the two sewers crossing Highway 174 where structural and corrosion assessments were completed. In both instances, the pipes were found to be safe, however the assessments confirmed the need for renewal.

The risk assessment approach being undertaken will include putting in place mitigation measures, such as increased inspection and monitoring, to keep track of the progression of any deterioration where a pipe is deemed to be in an accelerated need of renewal, or implementing methods to secure or stabilize any pipes and surrounding area while pipes are being repaired. The results of this enhanced risk-based approach will inform the development and execution of capital projects. Any financial implications will inform the 2014 capital budget.

***5. Procedures for scoping capital projects always include a discussion of the consequence of not proceeding quickly.***

Changes have been made to project scoping documents so that future projects include a specific reference to expectations on timelines for implementation so that higher priority projects can be communicated to the project manager responsible for implementing the renewal needs. This also provides an opportunity to identify any ongoing monitoring requirements so that the project delivery approach can be adjusted in a timely manner should there be a change in the condition of the asset.

Next Steps

Staff will continue to implement the report recommendations. The risk assessment work being done by the City will not only improve the City's existing asset management practices, but could also benefit other municipalities. Staff will engage in discussions with the Province on establishing minimum inspection requirements for critical sewers, as these are currently not defined. With the ongoing work related to the Comprehensive Asset Management Program and asset management staff involvement at the national level, the City is well positioned to engage in discussions that could assist both the City and other municipalities in reducing infrastructure risk exposure.

RURAL IMPLICATIONS

This is a City-wide report.

CONSULTATION

As outlined in the B.M. Ross and Associates report (Document 1 to this report), consultation was undertaken with City and contractor staff that were involved in the work leading up to the failure of the storm sewer pipe.

## COMMENTS BY THE WARD COUNCILLOR(S)

N/A

## LEGAL IMPLICATIONS

There are no legal implications associated with the recommendation contained in this report. However, there are a number of legal issues associated generally with the storm sewer pipe collapse and, more specifically, with the root cause of the failure, as detailed in the report. These legal issues can be subdivided into two broad categories, namely: (1) claims against the City; and, (2) claims by the City against Third Parties. Each of these matters is explored more fully below.

### Potential Claims Against the City

In the case of the pipe collapse, the range of possible claims against the City is, fortunately, limited. While one vehicle was claimed by the sinkhole immediately after it appeared, the driver was not seriously hurt, according to media reports and subsequent interviews. Nevertheless, Legal Counsel for the driver has given notice of a possible claim against the City, though the value of any claim may be limited by the provisions of the *Insurance Act*. In accordance with the standard practice for the administration of such claims, the Litigation and Labour Relations Branch have initiated discussions in an effort to resolve the claim without the necessity of formal, legal proceedings.

### Potential Claims by the City

As a result of the pipe failure, the City incurred costs of \$4.5 million related both to the emergency repair, as well as costs incurred for the management of the incident. The report notes that the original estimated cost of the replacement of the pipe was \$1.7 million. The question raised is whether the City may be legally able to recover any of these costs from external parties. In this regard, a preliminary review of the report suggests that the City may have legal claims against one or both of two parties, namely the original developer that installed the pipe or the contractor engaged in work on the pipe on September 4, 2012.

### Basis of Possible Claim Against the Developer

With regards to the original pipe that was installed in 1975, the report notes as follows:

*“This pipe was installed by the developer, following the former Township of Gloucester’s development control process. The approved drawing, and the subsequent as-built drawing, identified the pipe material as corrugated steel pipe (CSP) with the section under the two-lane former provincial highway as being tunnelled using a liner plate made of hot dipped galvanized steel with cement grouted on the exterior of the pipe and an asphalt coated bottom...”*

*The B.M. Ross report indicates that the material that failed on September 4, 2012, was not as identified correctly on the original approved drawings which were prepared following the pipe construction (i.e. not galvanized, not cement grouted and not asphalt lined at the bottom) and deteriorated at a faster rate than the rest of the storm sewer pipe. Given the limited available historical information, it is not clear what led to this discrepancy in the records.”*

If the pipe that was installed was not as specified in the original agreement between the Township of Gloucester and the developer, a claim may lie against the developer in breach of contract. It is important to note, however, that any such claim would be limited to the lost value of the infrastructure, being the difference between the intended and the actual lifespan of the pipe, based on the original cost of the work. This approach recognizes that any purchased asset has a defined lifespan, after which the purchaser is required to bear the cost of replacement at the then-current price. For this reason, the City's potential recovery would not be based on the \$1.7 million replacement cost, but rather on a percentage of the original price of the work: that percentage being the “lost” lifespan. For example, in the present case, if the intended life of the pipe was 50 years, the potential recovery would be a calculation based on 13/50ths (the pipe having lasted approximately 37 years) of the original price.

However, the limited documentation available suggests that the developer bore the entire financial cost of the sewer works, including the supply and installation of the pipe. As a result, while the former Township of Gloucester's approval of the neighbouring development may have been conditional on the installation of the sewer works, the municipality was not in the same contractual position as if it had purchased the infrastructure in question.

Although a legal claim against the original developer may still be possible, in theory, the lack of comprehensive documentation and evidence imposes serious practical difficulties. For example, if the record revealed that the former Township of Gloucester, or an employee thereof, consented to the substitution of the different pipe material, or if it was shown that the Township had inspected the works prior to assuming them, any claim by the City would be defeated. Further, it is unclear whether the original corporation that installed the pipe continues in existence or has any assets from which the City might recover in the event of a successful claim.

On a final point, the B.M. Ross report notes that a CCTV inspection of the pipe was conducted in 1997. This statement raises the possibility that any deficiency in the supplied pipe, or deviation from the original specification, was, or should have been, discovered at that time. As a result, a claim by the City would likely be statute-barred, based on this information.

In light of the significant difficulties associated with advancing a claim against the original developer, coupled with the limited scope of financial recovery and the City's own legal costs, the merits of pursuing such a claim, based on a preliminary review, appear to be few.

### Basis of Possible Claim Against the 2012 Contractor

The root cause analysis report notes that “the construction activities were a likely trigger to the collapse of the deteriorated section of pipe on September 4, 2012”. While this statement might prompt the suggestion that the contractor is liable for some of the costs associated with the collapse, the preliminary legal review raises little prospect for a successful claim in this regard. The reasons for this conclusion are set out below.

As a starting point, it must be noted that a claim against the contractor would need to be founded either in breach of contract or negligence. In respect of the former, the contractor in this instance was carrying out the very work that was required of it as part of the revised project scope. In terms of possible negligence, while the B.M. Ross reports finds that the presence of the contractor likely “influenced the timing of the collapse”, the report goes on to note that “the root cause of failure of the pipe beneath Ottawa Road 174 was that the structure’s inherently greater risks were not identified and acted on before the pipe’s structural integrity was lost.” This conclusion effectively forecloses any legal claim against the contractor, due to the fact that the responsibility to act more quickly to prevent the loss of the pipe’s structural integrity lay with the City itself in either August 2011 or perhaps as early as 1997.

Based on the above analysis, there is little prospect that the City could effectively pursue a legal claim against another party in order to recover all or part of the costs incurred as a result of the pipe collapse that occurred on September 4, 2012.

### RISK MANAGEMENT IMPLICATIONS

There are risk implications in managing physical assets. The independent review identifies opportunities to improve existing practices. The Comprehensive Asset Management Program recently approved by Council focuses on a risk-based approach to managing infrastructure investments with higher attention directed towards assets that pose the greatest risk to service. The intent is to develop a risk assessment process for critical sewers similar to the one developed for large watermains.

### FINANCIAL IMPLICATIONS

As indicated in the report the total cost of the repair is \$4.5M or an incremental \$2.8M from the original planned cost. This includes approximately \$0.3M of added operational costs incurred by departments such as OC Transpo, Public Works and Ottawa Police Services. Funding for the \$2.8M in incremental costs was approved by Council and was sourced from the sewer portion of other projects that have been deferred.

Additionally, the City’s Long Range Financial Plan IV for Tax Supported Capital recommended a number of funding strategies for consideration as part of future budgets which would provide the required level of investment to maintain City assets in a state of

good repair. This includes incremental funding for the renewal program of \$15 million per year starting in 2015 and establishes a targeted annual tax supported funding level of \$165 M (in 2012 dollars) by the year 2022 as outlined in the Comprehensive Asset Management Strategy.

Budget provisions have been made for asset condition assessments including \$6.45M for Infrastructure Assessment and Data Collection in 2012 (of which \$2M was incurred in 2012 with the remainder carrying forward into 2013) and capital forecast of \$13.5M for the years 2014 – 2016.

### ACCESSIBILITY IMPACTS

There are no accessibility impacts associated with this report.

### ENVIRONMENTAL IMPLICATIONS

There are no environmental implications associated with this report.

### TECHNOLOGY IMPLICATIONS

There are no technology implications associated with this report.

### TERM OF COUNCIL PRIORITIES

This report is consistent with the 2011-2014 Term of Council priority for Planning and Decision Making.

### SUPPORTING DOCUMENTATION

Document 1: Ottawa Road 174 at Jeanne D'Arc Pipe Collapse – Root Cause Analysis Report, B.M. Ross and Associates, December 2012

### DISPOSITION

The recommendations identified in the report prepared by B.M. Ross and Associates will be implemented by Infrastructure Services and Environmental Services.