

*Final Report*



# Underground Utilities Funding/Management Best Practices Review

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***Final Report***  
***Underground Utilities Funding/Management Best Practice Review***

We are pleased to submit our Final Report for the Underground Utility Funding/Management Best Practice Review. This report includes an inventory of underground utility practices within municipalities across Canada with a focus on the financing and governance aspects of underground wiring.

It has been a pleasure working with HRM on this project and we hope we can be of further service in the future.

Yours truly,

DILLON CONSULTING LIMITED

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## *Executive Summary*

The Halifax Regional Municipality (HRM) retained the services of Dillon Consulting Limited (Dillon) to perform an Underground Utilities Funding and Management Best Practices Review. While HRM has previously conducted analysis of using underground trenches for multiple utilities, the objective of this review was to focus on financing and governance options for provision of placing utilities underground.

To achieve this objective, 12 municipalities in Canada were contacted to determine their practices for underground utilities governance and financing. The jurisdictional review included a questionnaire created by Dillon with input from KPMG and HRM. Beyond the questionnaire, the municipalities were also asked to provide relevant bylaws or other pertinent policies or guidelines related to underground utilities.

Through the review of the other jurisdictions, it was recognized that buried utilities is the normal practice for municipalities of similar character to HRM, as 11 of the 12 municipalities surveyed have an underground wiring requirement for new developments. Based on our evaluation of the information obtained through the jurisdiction review, we have developed a number of findings for consideration by HRM, including but not limited to:

- A model for governance of an underground utilities requirement for HRM has been suggested that involves the development of a bylaw.
- It is expected that the financing requirements associated with the construction of underground utilities will be initially borne by the developer and charged back to the utilities and property owners.
- It is also recommended that the construction methodology be included in HRM's Municipal Servicing Standards so that the municipality will have the authority to approve proposed developments using a common trench.

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## 1.0 Introduction

The Halifax Regional Municipality (HRM) has been evaluating the merits of utilizing underground power and telecommunication services since commissioning Kinetrics Inc. in 2004 to produce an *Underground and Utilities Feasibility Study*. The Kinetrics Study highlighted the merits of using a common trench for multiple utilities (defined as power, telecommunications and gas for purposes of this report), including the fact that where power and telecommunications can be installed at the same time as natural gas piping, the excavation costs are minimized.

Following from the Kinetrics Study, HRM procured the *Engineering Study of Joint Gas, Power and Communications Trench* as developed by Stantec Engineering Ltd. in 2008. The major focus for this document related to the development of a defined trench cross section. The 2008 Study included an initial web search of other jurisdictions carrying out real estate development using a common trench approach for utilities, but it was recognized that additional review was necessary.

HRM does not have a general process, policy or guideline addressing the use of underground services for new real estate developments although it does have a pole free zone established within the Capital District. As an outcome of the 2008 Study, HRM engaged Dillon Consulting Limited (Dillon), supported by KPMG LLP (KPMG), to conduct a jurisdictional review of best practices related to the management and financial components of placing power and telecommunication services underground, and the merits of using a common trench as a cost savings measure for the utility companies.

### 1.1 Scope and Objectives

The primary objectives of this project include:

- A review of current practices employed by other municipal units within Canada to determine best practices as they relate to the governance and financial models used in the implementation of placing utilities underground;
- Using the findings of the review to provide commentary on trends and issues encountered in other jurisdictions with underground utilities practices; and

- Provision of recommendations to HRM based on the findings from the jurisdiction review as related to the governance and financial model for underground power, telecommunications and gas utilities within HRM.

An assessment of the costs associated with the implementation of underground utilities and using a common trench in HRM was assessed in the Kinetrics Report in 2005, the Marbek Report in 2007 and the Stantec Report in 2008 and was therefore not an objective of this study.

## 1.2 Benefits to Underground Wiring

Based on the 2007 study done by Marbek entitled *Economic Implications of Buried Electrical Utilities – Final Report*, it is evident that the benefits far outweigh the costs for undergrounding utilities for all stakeholders involved.

The benefits for various stakeholders include:

- Municipalities: protection of infrastructure, decrease in storm damages and improved aesthetics;
- Utilities: reduced costs due to reduced vegetation management costs, protection of infrastructure, decrease in outages, and avoided storm damages;
- Developers: higher prices for new developments leading to higher profit levels;
- Homeowners: cost savings from reduced heating and cooling costs, higher property values, and increased service reliability; and,
- Community (including rate payers): cleaner air and improved aesthetics for their communities.

The Marbek Report indicates that the above noted benefits of underground wiring outweigh the costs by approximately \$10,000.

## 2.0 Approach

To complete the project objectives, the project team developed a list of jurisdictions to be contacted to obtain information regarding their underground wiring practices. The list of

candidate municipalities was prepared in cooperation with HRM and included the following municipal units:

- Fredericton, NB
- Saint John, NB
- Quebec City, PQ
- Gatineau, PQ
- Ottawa, ON
- Hamilton, ON
- Winnipeg, MB
- Calgary, AB
- New Westminster, BC
- Vancouver, BC
- Victoria, BC
- Edmonton, AB (financing questions only)

The municipalities were selected to provide a cross section of models for using underground wiring with different financing mechanisms. These cities may be similar to HRM in terms of geography, population, municipal/utility structure and/or geology.

The review of other jurisdictions initially included a phone call from the project team asking if they were willing to be involved in our project. The phone call was then followed up with an e-mailed questionnaire as prepared in cooperation with HRM and KPMG. The questionnaire included relevant questions regarding governance and financing issues related to the use of a single trench for multiple utilities. The initial questionnaire is provided in **Appendix A**. The questionnaires were distributed to the municipal units and follow up calls were undertaken as required to obtain appropriate responses.

Upon receipt of responses to a majority of the questionnaires, the project team met with HRM to discuss any potential gaps in the data received. Additional follow up calls were undertaken to address the identified gaps. Six municipalities were identified for follow up questioning related to their financial models for provision of underground services. Although very specific information was requested regarding the decision making process for going underground, information such as council reports and background reports were not provided by any municipality.

The completed questionnaires are presented in **Appendix B** and copies of the relevant municipal bylaws, standards and guidelines are provided in **Appendix C**.



## **3.0 Current Operating Environment**

### **3.1 Legislation**

Prior to addressing methods for financing and governance, the governing legislation for HRM and the associated utilities must be understood. As described in the 2008 *Engineering Study of Joint Gas, Power and Communications Trench Report*, aspects of using a common trench for multiple utilities are included in several regulations and standards. A summary of requirements relevant to HRM is presented below:

#### ***3.1.1 Municipal By laws***

The Municipal Government Act (MGA) provides municipalities with the jurisdiction to make bylaws respecting utilities in street right of ways. Through this authority, HRM has developed the Subdivision Bylaw which designates that the developer must design and construct services consistent with HRM and Halifax Water Guidelines and Specifications. These requirements indicate that it is within HRM's jurisdiction to require provision of services according to their prescribed requirements, which may include underground installation.

HRM's Streets Bylaw requires that utilities obtain a permit before installing infrastructure within the Municipality's right of way. HRM therefore has the authority to prescribe where the utilities can be located within the street.

***Conclusion - Through the above legislation, HRM has the authority to require developers to install infrastructure underground and in specific areas of the right of way.***

#### ***3.1.2 Utility Legislation***

The delivery of gas to users is prescribed in the Pipeline Act which presents requirements for the design, construction, operation, maintenance or abandoning of a pipeline. The Pipeline Act provides for the installation of gas pipelines within the right of way by a licensed gas distribution company. The licensed gas distribution company must obtain approval from the local authority (e.g., HRM) to construct.

The Public Utilities Act outlines the authority of the Nova Scotia Utility and Review Board (UARB), including the authority to make regulations regarding the installation of infrastructure for utilities. The Public Utilities Act also sets out the rights for electrical utilities to install infrastructure in a public right of way. The utility is not permitted to erect infrastructure without consent from the municipality and the municipality has the right to charge a fee for allowing the installation. The municipality may refuse the installation, but the utility may apply to the UARB to allow the installation. The Public Utilities act also requires that electricity distributors make service available to new customers within their service area.

The Canadian Electrical Code includes provisions and restrictions for electrical infrastructure installed underground. The Telecommunications Act governs the telecommunications carriers. Although it does not address undergrounding in detail, it does provide for underground installation. The Canadian Electrical Code does include clauses for communications cables installed underground. The Canadian Electrical Code provides design requirements and does not limit the installation of underground wiring.

***Conclusion - These Acts and Codes provide no legislative limits regarding the requirement for underground infrastructure, but there are mechanisms where if construction is refused by a local authority (e.g. HRM) other higher legislative bodies (UARB and CRTC) may grant approval. The legislation also indicates that all Utilities may provide services through a right of way owned by HRM and that HRM may charge a fee for use of the right of way for utilities under the jurisdiction of the UARB.***

## **3.2 Existing HRM Practices**

The current general practice of utility construction for new development and redevelopment in HRM includes underground construction of municipal infrastructure (water, sewer and stormwater piping) and gas piping and above ground installation of electric and telecommunications wiring. There have been developments over the years that have been serviced using underground wiring.

In 1977, the City of Halifax Council designated the downtown core a “pole free” zone. At that time, utilities infrastructure needed to expand to keep up with the significant growth in the downtown. Cost sharing agreements were negotiated with both Nova Scotia Power and Maritime

Tel and Tel to assist with and encourage replacement and upgrade of overhead infrastructure with an underground system. By 1990, about 90% of the utility overhead infrastructure in the originally designated “short term pole-free zone” was converted to an underground system.

In 2005, the Halifax Regional Municipality extended the pole free zone to include the entire Capital District, which includes an expanded downtown Halifax as well as the downtown core of Dartmouth. Since that time undergrounding of power and telecom cables has been limited to large development projects, both municipal and private sector initiated. Most recently, HRM is participating in an undergrounding project in conjunction with a downtown Halifax development project, extending the undergrounding for an entire block. Cost sharing agreements with utilities and cooperation and contribution from the developer provide a cost sharing model which could be applied to future undergrounding initiatives in the core area of the municipality.

Outside of the pole free area, a number of developments have been undertaken by developers, including HRM, which specified underground utilities. A list of current underground wiring installations in HRM is presented in **Appendix D**.

One example of a community underground utility program was a development in the Cowie Hill area. For this development, the underground infrastructure was paid for through a loan payback arrangement with Nova Scotia Power. The loan was paid back over time on the electric utility bill. According to HRM staff, this process was initially well received by residents. The residents agreed in a poll to a further adjustment in their utility rate to provide for funds for maintenance, although this additional funding was ultimately not required.

*Conclusion - There is no bylaw that requires developers to install services underground, although there are policies that indicate that the Capital District be pole free. HRM has been involved with ongoing efforts to coordinate utility activities.*

## **4.0 Best Practices**

Initially, 12 questionnaires were sent to the municipal units targeted for review. Eleven out of the 12 units responded to the questionnaire. Six units participated in follow up discussions, including the addition of the City of Edmonton which was not included in the initial survey.

**Table 4-1** provides an overview of the status of use of underground utilities and common trench within each municipal unit surveyed.

**Table 4-1 Overview of Underground Utility Requirements**

<i>City</i>	<i>Status of Undergrounding of Utilities</i>	<i>Common Trench Requirement</i>	<i>Year Underground Utilities Requirement Implemented</i>
<b>Fredericton, NB</b>	Most developments use overhead lines, a few new developments have all underground utilities	No common trench	N/A
<b>Saint John, NB</b>	Underground utilities in new developments and redevelopments	No common trench requirement	1969
<b>Quebec City, PQ</b>	Underground utilities in new developments	Use common trenching	>4 years
<b>Gatineau, PQ</b>	Underground utilities in new developments	Use common trenching	2003
<b>Ottawa, ON</b>	Underground utilities in new developments and sometimes in redevelopments	Use common trenching	1960s 1960s (3 party trenching), 2003/03 (4 party trenching)
<b>Hamilton, ON</b>	Underground utilities in new developments and redevelopments	Use common trenching	1980s
<b>Winnipeg, MB</b>	Underground utilities in new developments	No common trench requirement	UK
<b>Calgary, AB</b>	Underground utilities in new developments and redevelopments	Use common trenching	1998
<b>Edmonton, AB</b>	Underground utilities in new developments	Use common trenching	>10 years
<b>New Westminster, BC</b>	Underground utilities in new developments and redevelopments	Use common trenching	1950s
<b>Vancouver, BC</b>	Underground utilities in new developments	No common trench requirement	UK
<b>Victoria, BC</b>	Underground utilities in new developments	No common trench requirement	UK

N/A – not available  
UK – unknown

This demonstrates that of the 12 municipalities consulted, 11 require underground utilities in new developments.

**Sections 4.1** and **4.2** provide different options and models for the management and financing of an underground utilities system, based on our findings from our other jurisdiction review.

## 4.1 Management

In accordance with the terms of the RFP, and as discussed and agreed with HRM, the management approaches were addressed under the following categories in the questionnaire:

- Governance/Implementation;
- Development/Construction (installation, additions and use of third parties);
- Ownership; and
- Monitoring and Maintenance (responsibilities, clearances/access).

### 4.1.1 Governance/Implementation

Governance and implementation refers to the mechanism that a municipality would apply to regulate the use of underground utilities. There are several different aspects to consider for the governance and implementation of underground utilities. In order to allow for consistency in approach, an underground utility protocol or policy must be created. A municipality must consider the enactment of a bylaw to require that the designated approach is used. The bylaw could include requirements for use of underground utilities for new developments and/or redevelopments. The bylaw could also require public consultation and/or the use of a specific construction practice (e.g. common trench). To provide even further direction, a municipality can include specific criteria on the design, construction and maintenance of the underground utility infrastructure in a municipal standard.

Every municipality surveyed used regulations (bylaw, policy and/or municipal standard) to standardize the respective underground utility requirements. Specific responses to the questionnaires are provided in **Appendix B**. Examples of bylaws/policies are provided in **Appendix C**.

A separate business unit may be created to support the implementation of the underground utility approach. This unit would serve to confirm that developments follow the policy and bylaw enacted and could manage the ongoing operations and maintenance of a common trench. Duties could also include:

- Review of development drawings/plans;
- Oversight and approval during construction;
- Collection, review and retention of as-built information;
- Management of the financing for construction; and/or
- Management of a utility clearances program (“call before you dig”).

Saint John, Gatineau, Ottawa, Hamilton and Calgary all have coordinating committees to manage various aspects of undergrounding services. Saint John has a business unit to manage infrastructure and associated maintenance and issues for the common trench and underground utilities systems. Gatineau has a public utilities management group that manages requests with respect to underground utilities and location of the utilities. The City of Ottawa’s common trench system is managed through a Utility Coordinating Committee (UCC). The UCC coordinates the underground wiring development processes. Hamilton has a UCC consisting of utility members and municipal staff which deals with all issues related to utilities: servicing; new development; and redevelopment. The City of Calgary has a four-party group, referred to as the Shallow Utilities Consortium, which manages and implements common trenching and underground utilities.

The advantage of having a specific entity for the management of the underground utilities is that there is a group focussed on one function. The group would maintain consistency through multiple projects. It is expected that the coordination of underground utilities would require minimal effort at the outset and would not be a requirement for HRM. If the management unit were a separate entity, it would add another component to the development process, which developers would likely oppose. The management unit may also add cost to HRM if it could not be accomplished by existing staff.

#### **4.1.2 Development/Construction**

Coupled with the governance and implementation, the establishment of development and construction requirements will be necessary. This will involve dictating the process for use of underground utilities in new developments and redevelopments. The design and construction criteria need to be identified including defining the entity responsible for respective aspects of the process.

The current HRM protocol is that developers prepare the necessary design documents and obtain permits necessary for the construction of utility infrastructure for a new development. The developer provides HRM with documents to obtain approval to construct. The developer schedules all of the construction and utility providers construct their own infrastructure.

It is not expected that this protocol would change when converting to underground utility construction. HRM would continue to serve in an approval and oversight role and the developer would still serve as the party responsible for the development and construction of the infrastructure. It is acknowledged that the coordination with utilities would be more onerous due to the construction underground within one common trench.

The municipality plays the role of approver in every municipality that was surveyed that has underground wiring requirements.

It is expected that HRM will maintain the approver and oversight role when using underground utilities. A set of design/development criteria can be included in the already existing Municipal Services System Specification (Red Book) to define how the utilities will be developed and where they can be located in the right of way.

The role of approver provides HRM with the opportunity to provide commentary on design where necessary and not be responsible for coordination and/or construction. The review of design documents may be accommodated within the current development approvals and therefore not require any additional administration.

#### **4.1.3 Ownership**

Ownership of the utility and/or conduit must be defined once the installation of the underground utilities system is complete. The current model in HRM is that HRM owns the right of way and the utilities own their own infrastructure. The developer passes over ownership of the right of way to HRM once they have met HRM's requirements. The ownership of the utility infrastructure is maintained with the respective utility. It is expected that this model will be continued when the utilities move to underground.

Through the jurisdictional review, all respondents to this question indicated that the municipality owns the right of way and the utility owns the conduit. However, while Montreal did not respond

to the Survey, Section 70 of the City Charter enables the municipality to “build, administer and maintain a network of conduits for the transmission and distribution of electricity and links by telecommunications; and govern the use of such network of conduits”.

It is noted that there is some added risk for increased road maintenance when having additional infrastructure in the right of way. The suggested construction of a common trench in the 2008 Stantec report involves construction off the road and should therefore minimize impact on the road structure and thus minimize additional maintenance.

If HRM were to take on partial ownership of the conduit, there would be a partial liability incurred for long term maintenance. It is expected when the utility takes on the ownership of the conduit and infrastructure residing within the trench, they take on the long term maintenance and replacement of the infrastructure.

#### **4.1.4 Maintenance/Monitoring**

The ongoing maintenance and monitoring must be addressed for the long term management of the underground infrastructure. The current practice in HRM is that each utility is responsible for the ongoing maintenance of their respective infrastructure.

The most common maintenance and monitoring scenario found through the jurisdictional review involves the utilities taking on all long-term operations, maintenance and monitoring responsibilities. In every jurisdiction that responded, the replacement costs are borne by the utility.

The number of outages and line breaks decreases dramatically when placing the infrastructure underground, but when damage occurs, it is often more difficult to locate and more expensive to repair. There is a perception that there is a risk that the maintenance and monitoring for underground infrastructure may be more complicated than overhead wiring. Through the costing analysis carried out in the 2005 Kinetics Report, it was assumed that the costs for maintenance and repairs were equivalent to the benefits of decreased outages.

In Quebec City and Gatineau, the developer is responsible for maintaining the trench for two years after construction, as part of a two year warranty to the utility companies. This could be an option for HRM and the utilities to consider as the two year period would be expected to allow



for most problems related to construction. There would be a cost associated with this requirement as the developer would want to recover any potential costs incurred during the warranty period.

The ongoing monitoring and maintenance also refers to the requirement for obtaining clearances for digging. Currently within HRM, each utility is contacted individually to obtain utility clearances. An alternative would be to set up a specific call centre to track all utility locations and provide clearances.

The Cities of Saint John and Gatineau have a one-call “call before you dig” system for obtaining clearances. Each utility is responsible to carry out locates on their infrastructure. In most other municipalities, the city and all utilities need to be contacted.

Although having a single point of contact would be easier for the consumer of utility services, to have one entity knowledgeable on the location and operations of every utility would be difficult to initiate and maintain. Therefore, it is expected that HRM will maintain the status quo and that each utility will be contacted for clearances.

## **4.2 Financial Models**

As discussed and agreed with HRM, the following five financial models were considered for the basis of development using underground wiring:

- Developer is responsible for payment for all infrastructure;
- Each utility is responsible for the cost of their own infrastructure;
- Use of a special rate structure for developments with underground wiring;
- Payment by a combination of utility/developer/municipality; and
- Staged approach for payment of infrastructure.

These five options refer only to power and telecommunications. The natural gas companies usually install their infrastructure on their own schedule and not in conjunction with the developers. It is expected that this system will continue.

To assist with understanding the financial implications of the installation of underground services to a possible residential unit owner, we have considered the scenario developed by Stantec in its report entitled *Engineering Study of Joint Gas, Power, and Communications Trench*. The report contained a description of the underlying assumptions, of which we have presented only certain relevant ones below.

In developing the estimate for its joint trench installation cost calculation, Stantec made the following assumptions:

- Utility services from the property line to the residential unit were excluded;
- Nova Scotia Power primary cables, street lighting cables, and telecom cables will be installed in a complete conduit system;
- Developer will supply and install street lighting system;
- 25% of all trench excavation is assumed to require drilling and blasting;
- The developer, or alternatively, a third party contractor (non-utility) will excavate the common trench and install power and telecom conduits;
- Gas pipe would be supplied and installed by Heritage Gas at no cost to developer;
- Communications companies will supply and install communication cables, pedestals and ancillary devices at no cost to developer;
- Nova Scotia Power will supply all underground equipment with a capital contribution from the developer equal to the incremental cost of the underground versus overhead equipment;
- Nova Scotia Power crews will install all underground equipment at no additional cost to the developer;
- Operational and maintenance costs have been excluded from this cost estimate;
- There are 24 single family unit homes; and
- The properties are 40 foot lots.

Based on the above assumptions, Stantec calculated the total per unit installation cost at approximately \$8,600 per lot.

#### **4.2.1 Developer Responsibility**

The developer is the leader of the construction of the utility infrastructure and the servicing of the land, so it is reasonable for them to be responsible for the cost of constructing the

infrastructure at the outset. It is expected that the developer would then recover their costs from either the end user or both the utilities and the end user. Costs that the developer is not able to obtain from the utilities would be expected to be incorporated into the lot price. Through the jurisdiction review, it was indicated that payment by the developer is the typical model for Quebec City and Edmonton.

In Quebec, the developer pays for all infrastructure at the outset and leases the wiring back to the utility. The developer also recovers costs from the homeowners through a lot charge when they purchase the property. The lot charge is determined on a case by case basis by the developer.

In Edmonton, the developers install and pay for the construction of the trench for all utilities except natural gas. The developers receive a partial rebate from the power company. The rebate is approximately \$1,000 per lot. The telecommunications companies supply the developer with the materials (cable and conduit) and they are installed at the expense of the developer, by the developer. The developers have requested a recovery of installation costs and the telecommunications companies have not complied.

All of the developers' costs are passed through to the lot purchasers in Edmonton. Costs absorbed by the utilities such as cable costs, rebate costs or full installation (in the case of gas) are recovered through the utility rates. No costs associated with underground utilities are borne by the Municipality.

The Edmonton utility rates charged to the lot purchaser are determined based on the cost of overhead service. The power company believes that the cost of an overhead line is the minimum standard and that cost should be part of the utility rate base. The power company takes the position that the incremental cost of burying the lines is more for the developer and City's aesthetic benefit and so they will not cover that cost.

In New Westminster, the developer also pays for the infrastructure, but the model is different because the developer collects money up front from the lot owners to cover the installation costs. For larger developments, such as high rise apartment buildings, the charge is estimated on a case by case basis. An example charge for a smaller single family subdivision development is approximately \$4,000 per lot. The developer determines the cost of providing the services and a

letter is sent to the property purchaser asking for a cheque of the required amount to be sent back to the developer.

The advantage to the Developer Pay model, from the HRM perspective, is that the responsibility for construction and installation of the infrastructure lies with the developer. It is up to them to recoup the costs from the utilities and/or ultimate home owner. This model would minimize scheduling conflicts as the developer is the entity that is coordinating the efforts of all parts of the development. A common trench for all utilities would be straightforward to coordinate for HRM if the developer is responsible for all utilities and the associated cost savings could be realized.

In this case, the developer would apportion the incremental cost of \$8,600/lot to the homeowner and utilities as appropriate. The entire cost may be built into the lot price if the utilities will not bear any costs other than equivalent to overhead.

#### **4.2.2 Utility Responsibility**

This model involves each utility paying for the entire construction cost for placing their respective services underground. The City of Calgary utilizes such a model, although it is not applied consistently in all cases.

In Calgary, the construction costs are paid for by the utilities in accordance with their own investment policies and per agreed cost sharing arrangements. There is a cap on the amount the utilities will contribute, and in the event that a particular utility's investment policy does not cover their allocated share of the trench costs, the developer is required to pay the remaining incremental costs. For standard residential underground distribution systems, the electric, telecommunications and natural gas company's investment policies will generally cover all of the construction costs on public property including the utility right-of-ways along public thoroughfares. The developer is required to pay the additional costs to have the service extended on the customer's private property from the main utility infrastructure to the house.

A positive aspect of this model involves the fact that the developer is not required to front utility costs which would help their cash flows. The costs for construction are borne by those that can recoup them directly from the user of the particular utility. The construction of the utilities would need to be completed in a coordinated manner in order to benefit from the cost savings of a

common trench. The drawback would be that cost for utilities would increase and the user may not be willing to bear that cost should it be passed through directly as a cost for utility service.

With reference to the assumptions above, the additional cost of \$8,600/lot would need to be apportioned to the cost incurred by each utility. The utilities will then recover their costs from the owners through their rate systems. This could involve a special rate for a particular development or a charge to a wider area of utility users. Alternatively they could potentially charge more at the outset for hook up fees rather than a deferred payment through user rates.

#### **4.2.3 Utility/Customer Underground Rate**

In this model, the utility companies are responsible for paying for the construction of the underground infrastructure. They recoup the cost through implementing a special utility rate established through an agreement between the utility companies and the owners.

As described in **Section 3.2**, this model was used in HRM in the 1970s for a new housing development in the Cowie Hill area. An agreement was made between Nova Scotia Power Incorporated (NSPI - currently NS Power) and the developer. NSPI agreed to participate in the financing of the underground wiring services through an additional rate to the customers ultimately being serviced in the housing development.

The developer sold the distribution system to NSPI for the full value of the normal cost of providing the service overhead plus the additional cost required to place the distribution system underground. NSPI was then reimbursed for the costs required to place the distribution system underground through placing a loan pay back surcharge on all tenant and owner occupiers of the housing development. In addition to the normal power charges, *'each customer of electric service and power will pay to NSPI a surcharge of \$0.75 per month, and each owner will accept responsibility for the payment of a surcharge in the amount of \$1.00 per month, for a period of 30 years'*. A copy of the Cowie Hill Agreement is attached in **Appendix E**.

The advantage to this arrangement is that the cost can be more acceptable to the homeowner as it is spread out over a period of time. The challenge is that the differential fee may be more than they can bear. The developer would likely be agreeable to this type of model as they do not incur the cost and they do not have to recover it from their property owner.

As costs may vary from development to development, this model could become cumbersome as a new agreement will have to be made and a new rate structure created for each unique new development.

The following table is based on an incremental installation cost of \$8,600/lot and reflects the required addition to current rates that would be required per residential unit assuming that all costs are passed onto the consumer and no financing charges are applied.

**Table 4-2 Special Rate Analysis**

<i>Payback Term (years)</i>	<i>Property Owner</i>	
	<i>Annual Cost Recovery</i>	<i>Monthly Cost Recovery</i>
	(\$)	(\$)
20	430.00	35.83
25	344.00	28.67
30	286.67	23.89
35	245.71	20.48
40	215.00	17.92

There is no evidence to indicate what level of increase in costs would be acceptable to a property owner or how relative the above figures are to the current utility costs for a typical property owner. The values presented in **Table 4-2** represent full recovery of the incremental undergrounding costs for all utilities, not just power and telecommunications.

Additionally, it would be unreasonable to assume that there would be no financing charges associated with a deferral of payment for the upfront cost of installation which would increase the annual or monthly costs above. We have excluded financing charges from our summary calculation above as the financing charges will ultimately be dependent on the cost of capital for the entity financing the installation of the underground wiring.

**4.2.4 Combination of Stakeholders Pay**

This model involves the developer, the utility and/or the municipality contributing to the construction costs for placing services underground in a new development, and the municipality and the utility both contributing to the construction costs for placing services underground while re-developing a city street.

A common approach in most jurisdictions for new developments is that the utilities will pay the equivalent cost to the service placed overhead, and the developer is responsible for the remaining costs to underground the service. In a re-development of a city street, the utility will pay for the equivalent cost as if the service was to be placed above ground and the developer and/or the municipality pays the remainder. The developer recovers their costs by incorporating it into the price of each lot.

Saint John and Ottawa use this model. As described in **Section 4.2.2**, Calgary also uses this model in some regard, as the developer is required to pay the additional costs to have the service extended on the customer's private property from the main utility infrastructure to the house, and occasionally they will also need to contribute to the construction costs of the main line. In Saint John, the financing of the trench depends on who is leading the development, the City or the developer. The different financing configurations are described as follows:

- *Undergrounding of existing City Streets:* Generally, through cost sharing, the City of Saint John will pay for all civil costs and Saint John Energy will pay all electrical costs.
- *For a new development:* The developer will pay for all civil costs and a certain amount of the electrical costs. Saint John Energy will do an estimate of the costs for providing the service underground versus above ground. Generally, they will pay what they normally would pay for electrical costs to have the service above ground, and the developer will pay the difference.

In Ottawa, the developer and the utilities are responsible for paying for the construction of the trench. Each utility has a unique arrangement with the developer and they are as follows:

- *Hydro:* Hydro pays the equivalent costs for overhead services, and the developer pays the additional cost for burial.
- *Telecommunication Companies:* Due to the competitiveness of the market, it sometimes varies as to which agency pays for the construction. Some developers have entered into exclusive servicing agreements with the telecommunication companies so that they pay a fee to have exclusive access to the subdivision.
- *Natural Gas:* Gas pays their own costs for installation as negotiated with the developer.

Developer costs are ultimately charged back to the resident through costs within the sale price. Any utility charges are recovered through the rate structure. Since most wiring is underground in Ottawa, no specific information was available on utility rate charges or what percentage is paid by which mechanism. It was noted that there has been a three to ten times cost differential for installing utilities underground instead of overhead, depending on various factors.

#### **4.2.5 Staged Approach**

A staged approach to implementing the underground wiring is a model which is adjusted over time. In this situation, the municipality will offset some or all of the additional costs to provide the services underground. This is intended to provide a transition in financing for the developers and utilities from the current situation to all services being underground. The process involves the municipality's contribution decreasing over time, and eventually the developers and/or utilities will be solely responsible for paying for the underground wiring.

The City of Gatineau used such an approach when they implemented the underground wiring requirement in 2003 when they amalgamated five cities. To help with the implementation of underground wiring, the City decided to finance the cost of burying the utilities through a local improvement tax charge to the phase of the development project where the work was undertaken. The developers were responsible to coordinate and do the work, and they would be reimbursed for the cost to bury the wiring.

The utility companies reacted positively to the decision to go underground. Some of the developers did not approve of the decision as it would increase the cost of development. The City's decision to finance the undergrounding reduced the protest from developers and utilities.

From the inception year 2003 until 2007, the City of Gatineau was funding 100% of the cost to underground utilities. In 2008, they decreased that amount to 50%, and as of 2009 they are not contributing at all to the cost of undergrounding utilities. The City received some protest over the decision to stop contributing, but it is now accepted by all stakeholders.

The primary advantage to this approach is that the public and stakeholders would have time to get used to the advantages of underground infrastructure before they incur the full costs. The negative aspect is that the municipality will need to incur the costs for a period of time and will need to recover the cost from the tax base of either the specific area involved or a larger set of



taxpayers. Ultimately, this approach serves only to delay the requirements for the developer and utilities to pay for undergrounding of services for developments.

The following table provides an example of how to stage the costs to the homeowner over time using a similar method to Gatineau assuming no change in costs over time.

**Table 4-3 A Possible Staged Costing Example**

<i>Year</i>	<i>Cost to HRM</i>	<i>Cost Per Lot to Homeowner</i>
2010	100%	0%
2011	75%	25%
2012	50%	50%
2013	25%	75%
2014	0%	100%

Additional information on specific municipalities can be found in the completed jurisdictional review questionnaires presented in **Appendix B** and the municipal bylaws presented in **Appendix C**.

## **5.0 Evaluation**

### **5.1 Decision Making Criteria**

The following high level decision criteria have been developed to assist with assessing the recommended governance and financing frameworks for HRM's proposed underground wiring system. The development of decision criteria is important to confirm the interests of HRM are consistent with the conclusions of this report. The following provides a list of criteria to be used in evaluation of the proposed options.

- The benefiting parties should pay;
- The direct financial impact to HRM should be minimal;
- Construction, financing, operational and replacement risk should be transferred to parties to the extent possible;
- The design and output of the underground wiring should meet the interests of the potential lot owners;
- Governance structure should align with existing by-laws;

- Developments are self-sustaining;
- Affordability and competitiveness, and
- The utilities cost recovery should be through a rate adjustment.

A summary of the evaluation is provided in **Appendix F**.

## 6.0 Conclusions

The recommended next steps for implementation of a development utilizing underground utilities within HRM include the following:

- HRM should consider developing a bylaw that requires developers to bury all utilities in all new developments. The bylaw should include clauses reflecting the following:
  - Developers shall pay for and install utilities according to the Municipal Servicing Standards requirements;
  - An acceptable common trench design shall be included in HRM's Municipal Design Guideline.
  - HRM should consider requiring that the developer maintain a warranty for the maintenance and replacement (if required) of the underground utilities; and
  - The by-law should set out any requirement that would allow a developer to opt out of the common trench system, e.g. for infill developments where all utilities are above ground.
- HRM should include the trench cross section as previously approved in the Municipal Servicing Standards.
- HRM should recommend that utilities consider developing an agreement for use of a common trench including how the construction should take place.
- Developers may charge back the cost of underground utilities to the utility or the lot purchaser depending on available options.

It is expected that the cost of the development of the common trench will be initially borne by the developer. It is proposed that the developer will be reimbursed from a combination of the utilities and the final land owner. The cost for gas distribution systems will be reimbursed by the licensed gas distributor as is the current practice. It is proposed that the reimbursement of costs

for burying electrical and telecommunications infrastructure will be partially paid by the utility and partially recovered from the property sales.

The requirement for underground infrastructure has become the normal practice for cities of similar size to HRM. In other jurisdictions, the requirement has been dictated in bylaw and municipal guidelines and has been in place for many years. None of the other municipalities contacted indicated that they have become involved in the financing of the underground infrastructure in new developments. There has been no indication that this infrastructure has led to decreased development. In fact, there is a noted benefit to underground utilities acknowledging that the community is more aesthetically pleasing (increased property value) and utility infrastructure is more reliable.

## 7.0 References

City of Calgary, Shallow Utilities Joint Provisioning Guidelines, May 2008

City of Edmonton, Regulation of Work and Equipment Installation on City Lands Bylaw, November 2002.

City of New Westminster, Electrical Utility Bylaw, June 2009.

City of New Westminster, Subdivision and Development Control Bylaw, March 2007.

City of Ottawa, Guidelines for Utility Four Party Trench, February 2007.

City of Saint John, Subdivision Bylaw, December 2005.

CERUI, <http://www.ceriu.qc.ca/f?p=105:34:0>

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Halifax Regional Municipality, Pole Free Areas, Report to HRM Regional Council, October 18, 2005.

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Kinetrics Inc., Underground Utilities Feasibility Study for Halifax Regional Municipality, March 4, 2005

Marbek Resource Consultants, Economic Implications of Buried Electrical Utilities – Final Report, March 21, 2007.

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Stantec Consulting Ltd. (Formerly Neill and Gunter, Engineering Study of Joint Gas, Power and Communications Trench, Halifax Regional Municipality, Project 19565; April 2008.

See individual surveys for list of contacts at each municipality.

**Appendix A**  
**Blank Questionnaire**

**Appendix B**  
**Completed Jurisdictional**  
**Review Questionnaires**

**Appendix C**  
**Municipal Bylaws, Standards and Guidelines**



**Appendix D**  
**List of Current Underground Wiring Installations in**  
**HRM**

**Appendix E**  
**Cowie Hill Agreement**

# **Appendix F**

## **Evaluation**