

# MEMO / NOTE D E SERVICE



To / Destinataire **Chair and Members of Transit Committee/** File/N° de fichier: ACS2009-ICS-DCM-0007

**Président et membres du Comité des services de transport en commun**

From / Expéditeur **Nancy Schepers, Deputy City Manager/Directrice municipale adjointe, Infrastructure Services and Community Sustainability/Services d'infrastructure et Viabilité des collectivités** *Contact Person/ Personne ressource : Nancy Schepers, 613-580-2424, 12230 Nancy.schepers@ottawa.ca Marian Simulik, 613-580-2424, 14159 Marian.simulik@ottawa.ca*

**Marian Simulik, City Treasurer/ Trésorier municipal**

Subject / Objet **Costs and Affordability - Downtown Ottawa Transit Tunnel (DOTT), Tunney's Pasture to Blair Station/ Coûts et abordabilité – Tunnel de transport en commun au centre-ville d'Ottawa (TTCCVO), du pré Tunney à la station Blair** Date: October 22, 2009

---

## **Downtown Ottawa Transit Tunnel Cost Estimate**

This memo is to provide you with the functional design cost estimate for the DOTT project and an

update to the Treasurer's November 2008 memo on affordability to reflect this refined cost estimate.

### **Key Messages**

- 
- The affordability modelling shows that the City costs for Phase 1 - Increment 1 of the TMP will not cause any tax increases.
- The City can afford to pay its share of the costs of Phase 1 of the TMP
- The Fiscal Framework also identifies a revenue-to-cost ratio target of 55% for transit services. At the completion of Increment 1 of Phase 1 in 2019 this ratio can be achieved with changes in local routing as identified in Transit Services 10 – year tactical plan.
- The November 2008 Transportation Master Plan (TMP) cost estimates were high-level estimates developed to support Council's decision-making between competing options related to Ottawa's transit plan for the future.
- TMP Costs provided to Council in November 2008 did not include costs associated with land acquisition or a project office.
- Functional Design estimates are more accurate estimates that allow the project to move from planning to implementation. This cost estimate includes land acquisition, DOTT project scope changes, design refinements and phasing modifications.
- The affordability model includes an assumption that the two upper-tier levels of government will each contribute one-third of the total design and construction costs of the Transit portion of the TMP. Any increase in the subsidy, such as that committed to the Region of Waterloo, would provide the City with additional financial flexibility, as the City share of costs would decrease accordingly.

-

### **Cost Estimate Evolution**

The project is being developed in consultation with a team of experts with extensive experience in large capital transportation projects. In addition staff retained additional expertise to review the cost estimates. Their credentials are listed in Appendix A of this memo.

The following section explains the cost evolution that normally occurs in the migration from planning to implementation of a capital project of this size:

### **TMP Estimates**

Cost estimates provided as part of the Transportation Master Plan (TMP) in November 2008 were high-level estimates developed to support Council's decision-making between competing options related to Ottawa's transit plan for the future. The November 2008 cost estimates were based on industry standards and were understood to be subject to refinement by the functional and detailed design processes and design refinements for each capital project once the overall plan was approved. Council

was advised at that time the estimates provided during the TMP decision-making process did not include costs associated with land acquisition or project office costs.

## **Functional Design Estimates**

The cost estimates that are being provided to you as part of this memo were developed to support the Functional Design and Environmental Assessment (EA) of the Downtown Ottawa Transit Tunnel (DOTT). These more advanced cost estimates will provide important context for a Council decision on the Functional Design and will be available for public consultation as part of the October 26, 2009 Open House. The completion of the functional design provides for an increasingly accurate cost estimate for the project and includes elements that are not typically included in a strategic planning exercise such as the TMP.

Additional elements incorporated into the Functional Design cost estimates include land acquisition, DOTT project scope changes, design refinements and phasing modifications.

-

## **Description and Cost of Functional Design Elements**

### **Land Acquisition**

Now that an alignment has been confirmed we are able to advance functional design of stations and selection of a location for the maintenance facility. This advancement makes an estimate of land acquisition possible. The cost estimate to acquire the required land along the DOTT corridor is \$140[1] million. The estimate includes:

- Subterranean rights
- Staging areas to facilitate construction
- Maintenance facility
- Station access

### **Project Office Costs**

A project office has been established to continue to move the project forward from a planning phase to implementation. Costs for staffing and operation of this office are estimated to be \$50 million over the life of the project. This cost represents 3.6% of total project hard costs. The industry standard is that project office costs typically fall in the 4% plus range. This estimate will be reviewed and adjusted once Council selects a procurement process.

Initially, project office costs will be used to:

- Support funding negotiations with senior levels of government.
- Address identified project risks
- Secure land and property rights
- Identify development opportunities
- Coordinate planning works to support Official Plan (OP) land use goals, TMP goals, and arts and culture.
- Manage senior government regulatory requirements
- Investigate procurement options including Infrastructure Ontario (IO) as a procurement agent
- Communication and Outreach
- Support preliminary engineering and detailed design
- Support the development of output specifications
- Secure contract and construction management support
- Coordinate urban design and business development

### **DOTT Scope Change**

On May 27, 2009 Council approved a scope change to the tunnel component of the DOTT project by adding approximately 750 metres (30 percent) to its length, thereby moving the Campus station underground. The cost of this scope change is estimated at \$150 million.

### **Design Refinements**

Design refinements are the result of examining the approved project alignment, stations, staging areas and requirements, and identifying the requirements and adjustments necessary for implementation. The total estimated cost of these design refinements is \$100 million. This figure includes:

- Enhanced accessibility at the underground stations
- Elevator renewal at existing stations
- Canopy coverings for all above-ground stations to improve customer comfort and reduce winter maintenance costs
- Station refinements to improve access and connectivity

### **Phasing Modifications**

Phasing modifications are those costs related to strategically advancing elements of subsequent increments of the TMP. Some of these modifications will result in future cost savings over the duration of the TMP's implementation. Total estimated cost for this modification is \$160 million and includes:

- Adding tail tracks at Tunney's Pasture
- Making Tunney's Pasture an interim terminal transfer station
- Building Bayview as a transfer station
- Pre-building the maintenance facility to accommodate the complete Phase 1 requirements

-

### **Peer Review**

The MMM Group's third party review identified three key issues with the potential to increase the DOT Functional Design cost estimate. MMM also identified areas where the Delcan estimate was higher than industry standards, which indicates a potential for an adjustment downward. Also included in their review was an acknowledgment that their approach was a top down (high level) review and not a more detailed bottom up analysis, as used by Delcan.

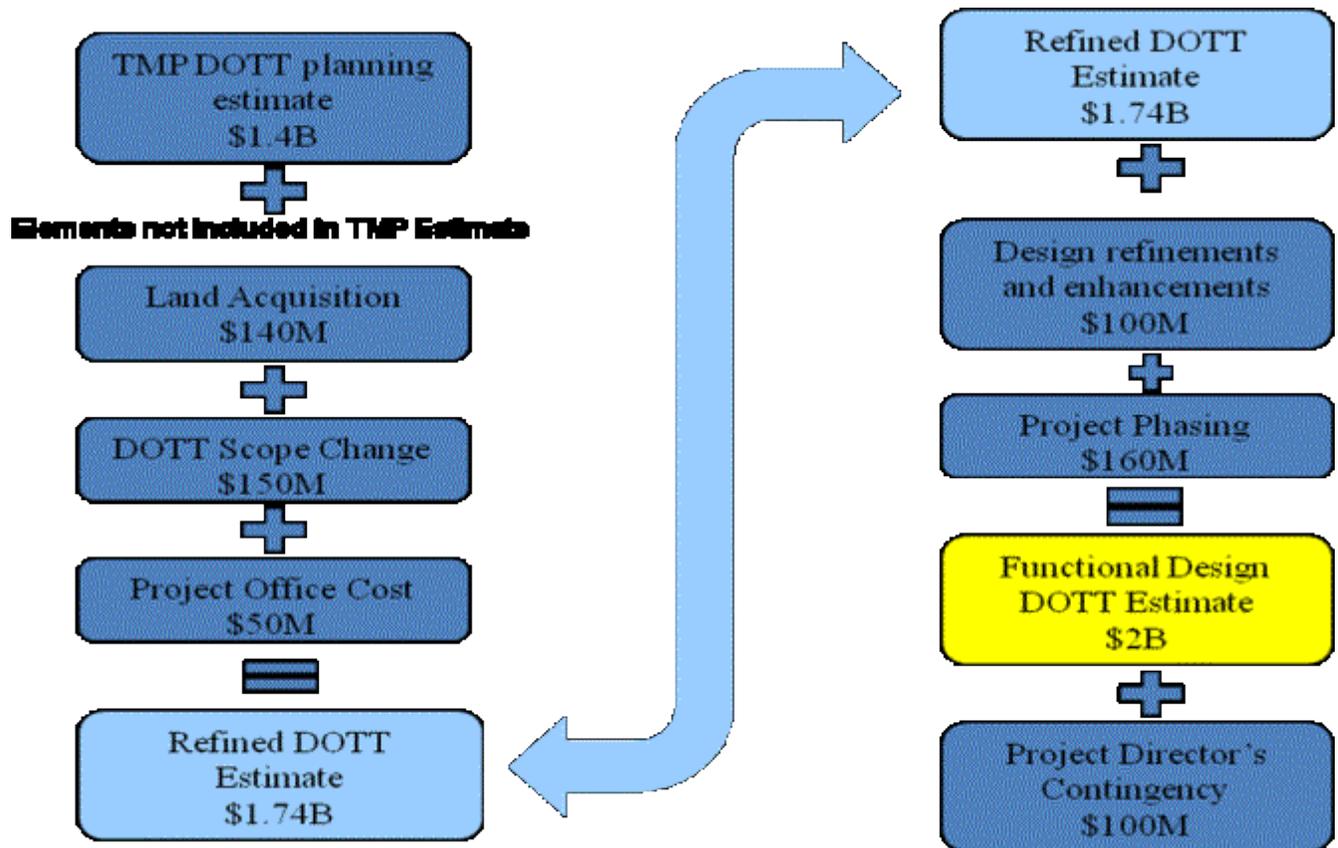
Staff reviewed both the Delcan functional design estimate and the observations made by MMM Group and are confident that Delcan's estimates are appropriate considering the advanced nature of the functional design. Staff did, however, acknowledge MMM's assessment and agree that it is reasonable to add additional contingency to the project cost estimate given where we are currently.

Therefore, staff has added a Project Director's contingency of \$100 million to the overall project cost (see Figure 1).

**DOTT Functional Design Cost Estimate Break Down**

**Figure 1**

*Figure 1 summarizes the progression outlined above.*



**Figure 2**

*Figure 2 presents the overall project costs by cost element*

**Total project elements and cost estimates are as follows:**

Project Element	Refined Cost Estimate
Transit Tunnel and Underground Stations	\$735M
Transitway to LRT Conversion Tunney's to Blair	\$540M

<b>Maintenance Facility and vehicles</b>	\$515M
<b>Property, public art, insurance</b>	\$160M
<b>Project Office</b>	\$50M
<b>TOTAL</b>	<b>\$2B</b>
<b>Project Directors Contingency</b>	\$100M
<b>TOTAL</b>	<b>\$2.1B</b>

Subject to Council approval of the Functional Design in early 2010, the DOTT project will continue moving towards implementation by finalizing the EA process, securing property rights, developing output specifications and completing preliminary engineering and detailed design. These project activities are outlined in more detail in the Council approved Transit Critical Path (an updated version was sent as a memo on October 13, 2009). Project cost estimates will be subject to further refinement as we advance to detailed design.

### Affordability Model

#### **Affordability**

Though the costing element of this memo speaks to the functional design cost estimate of the DOTT project, the affordability piece, in order to accurately reflect the future pressures, will encapsulate all of Increment 1 in the modeling up to 2019, and speak to the two other elements in the modeling post 2019.

In order to determine whether the refined costs of Phase 1 - Increment 1 of the Transit portion of the TMP affect the overall affordability, the Finance Department developed a high-level funding model, which includes all Transit capital needs over a 20-year time frame. The model also includes the impacts that Increment 1 implementation will have on the operating budget during the construction period, as identified in the 10-year transit tactical plan. As with any forecast, the further it extends into the future the less reliable it becomes, but in order to determine whether future increments of the Transit portion of the TMP are still affordable, the model was extended to 20 years so that it could include increments 2 and 3.

#### **Costs Included in the Model**

In addition to the Transit costs identified in the TMP, the model also includes all of the other Transit capital works that are required over the time period. These include the yearly lifecycle renewal program, as well as the strategic capital initiatives planned for transit and any residual growth that was not part of the TMP. The full costs identified for Increment 1 of Phase 1 of the TMP are within the first

ten years, and the costs for Increments 2 and 3, as identified in the TMP in late 2008, have been included in the last ten years of the model. The costs for Increments 2 and 3 are very high-level estimates and are subject to the same caveats as applied to the initial high-level estimates for Increment 1.

All capital costs identified have been inflated at the rate of 2.5% per year as they were developed using 2009 dollars.

The ten-year tactical plan points out that, during the construction period, Transit Services can expect to experience increased operating costs and decreased revenues. To smooth the impact this will have on taxation, the model includes one-time contributions that will be made from the capital reserves to the operating budget during those years. The model does not include the operating savings that should be realized starting in 2019 as identified in the tactical plan.

The total costs that need to be financed in the model are summarized as follows:

<b>Costs Included</b>	<b>Forecasted Expenses from 2010 to 2019 (\$M)</b>	<b>Forecasted Expenses from 2010 to 2029 (\$M)</b>
<b>Costs Included</b>		
Transit portion of TMP (incl. DOTT)	3,109	4,953
Lifecycle Renewal	559	1,334
Residual Growth	62	145
Strategic Initiatives	24	52
<b>Total Capital</b>	<b>3,754</b>	<b>6,484</b>
Operating Impacts during Construction	149	149
<b>TOTAL FUNDS REQUIRED</b>	<b>3,903</b>	<b>6,633</b>

### Sources of Funding

The model includes assumptions around the funding sources the City has available for the Transit capital program. These sources and the assumptions around them are as follows:

<b>Sources of Capital Funding</b>	<b>Assumptions</b>	<b>Revenue Sources in 2010 (\$M)</b>	<b>Revenues from 2010 to 2019 (\$M)</b>	<b>Forecasted Revenues from 2010 to 2029 (\$M)</b>
Transit - Capital Tax	Increases yearly by inflation	64	723	1,723
Transit Development Charges	Increases yearly as per phase-in, new by-law in 2014			
Provincial Gas Tax	increases charge	16	251	784
Federal Gas Tax	Does not increase	21	206	412
Ontario Bus Replacement Program	Does not increase	50	500	1,000
	Continues to fund 33% of the cost of bus replacements	10	72	160
<b>TOTAL</b>		<b>161</b>	<b>1,752</b>	<b>4,079</b>

## Funding Model

The funding plan has been developed using the sources of revenue and the costs identified above. The model includes an assumption that the two upper-tier levels of government will each contribute one-third of the total design and construction costs of the Transit portion of the TMP. Any increase in the subsidy, such as that committed to the Region of Waterloo, would provide the City with additional financial flexibility, as the City share of costs would decrease accordingly.

Sources of Funding	Funding Plan from 2010 to 2019 (\$M)	Funding Plan from 2010 to 2029 (\$M)
Ontario Bus Replacement Program	72	160
66% subsidy on TMP construction	1,743	2,865
Transit - Cash	709	1,282
Transit - Debt	38	38
Development Charges -Cash	165	210
Development Charge- Debt	449	802
Provincial Gas Tax- Cash	169	352
Provincial Gas Tax - Debt	26	26
Federal Gas Tax	345	711
Federal Gas Tax - Debt	187	187
<b>TOTAL</b>	<b>3,903</b>	<b>6,633</b>

The Sources of Funding chart identifies the amount of cash that is expected to be received in the ten- and twenty-year time periods. In funding the expenses as much cash as possible was used, but for timing reasons, in some cases debt needed to be applied. The difference between the amounts identified in the sources of funding chart and the amount of cash applied to fund expenses in the model is being used to either service the debt or remain within the reserve balance. For example, by 2019 \$723 M of tax contributions towards transit capital will have been received, \$709 M will be used to fund capital, and of the \$14 M difference \$5 M will have been used for debt financing and the \$9M balance will be in the reserve.

It should be noted that the funding model prepared for this exercise will not align precisely with the 10-year capital plan identified as part of the 2010 budget. The model assumes inflation on future capital costs, which have not been incorporated into the 10-year capital plan as that plan is updated each year as part of the budget exercise and can therefore be adjusted for actual inflation.

### Alignment with the Fiscal Framework

The fiscal framework has two funding principles that must be met with respect to the use of debt. These principles are:

- Principal and interest for tax supported debt is not to exceed 7.5% of the City's own source revenues
- The increase in debt servicing for non-legacy projects in any year will not result in more than a one-quarter of 1% property tax increase.

The only tax-supported debt included in the model is the \$38 million identified above as Transit - Debt. The funds within each category of revenue are sufficient to both contribute the cash identified and to service the debt, therefore the debt servicing for the \$38 million in debt will not result in a tax increase, and thus the plan identified is in compliance with the fiscal framework.

The Province also establishes a debt limit for the City and the 2009 limit was set at yearly debt servicing of \$341 million. The province has indicated that if the City were to borrow for a 20-year term at a rate of 7% this would allow an additional \$3.6 billion in borrowing. The total debt authorized under the 20-year plan of \$1.053 billion is well below that threshold.

The Fiscal Framework also identifies a revenue-to-cost ratio target of 55% for transit services and at the completion of Increment 1 of Phase 1 in 2019 this ratio is achieved.

## **Conclusion**

The City has the financial capacity to afford its share of Phase 1 of the TMP including its share of the construction of the DOTT project. The sources of funding and the level of debt required for the City's share is in accordance with the City's Fiscal Framework.

### Next Steps for Project Funding

-

Costs and affordability are important inputs to decisions on functionality. Council must be satisfied that the value proposition supports the level of investment.

Council, as part of the TMP deliberations in November 2008, directed staff to seek funding from our senior government partners in support of Phase 1 of the TMP.

As a result, staff has had ongoing discussions with counterparts federally and provincially throughout the TMP and now the DOTT project though to date formal endorsement has not been received.

Staff will be setting up follow-up meetings with the current estimates and funding models to explore

approaches that provide the appropriate support levels.

If you have any questions please do not hesitate to contact Nancy at ext. 12230 or Marian at ext. 14159.

*Original signed by*

Nancy Schepers, Deputy City Manager

Marian Simulik, City Treasurer

Attach: Appendix A – List of Expert Consultants and Credentials.

## APPENDIX A

### **Expert Consultants**

-

Below is a list of the City's expert consultants who have been commissioned by the City to aid in the development and review the functional design estimates:

#### **Delcan Corporation**

Delcan, commissioned to develop the functional design and cost estimates, is an industry leader in transportation and transit projects with over 50 years of experience in the field. Delcan's past projects include work with the Sheppard Subway, Spadina Subway Extension, Transit City and the Union Station Rail Corridor Infrastructure Program in the City of Toronto, Evergreen Line in Vancouver, Peer Review of the Laval Extension in Montreal and the first phase of the C-Train in Calgary.

#### **Halcrow Group**

To ensure the highest level of accuracy on tunnel planning and cost estimation, Delcan partnered with Halcrow to focus on the tunneling requirements of the City's TMP. Halcrow has over 75 years in the tunneling industry with experience tunneling in a variety of different environments. Past tunneling projects have included: the Edinburgh Airport rail link, the Tai Wai station subways in China, and the Cigar Lake Mine tunnel in Saskatchewan, among many others.

#### **MMM Group**

As part of the due diligence required to provide as accurate a cost estimate as possible, staff requested that MMM Group complete a third party review of the cost estimates provided by Delcan. MMM Group, established in 1952, has extensive experience in consulting, engineering, planning and project management in Canada and around the world.

-

---

[1] All cost estimates, unless otherwise indicated, represent 2009 dollars.