

APPENDIX A

Discussion of Cost Estimates and Impacts for City of Edmonton's Valley Line LRT – Phase 1 (Mill Woods to 102 Street)

Table 1 – Comparison of Metro Line Extension vs. Valley Line LRT Projects

	Metro Line Extension	Valley Line (MW to 102 St.)
Distance	3.3 km	13.1km
Number of New Stations	3	1 ¹ + 11 at grade stops
Identified Capital Cost	\$665 ² Million (actual)	\$1,800 ³ Million (estimated)
Main Construction Years	2010 - 2013	2016 – 2020+ (best case est.)
At Grade Terrain Type	Downtown roads, flat	Downtown roads, flat + Medium – high volume urban roads, flat
At Grade Portion	Most	Most
Tunneled below grade	Some (700m)	Some (~500m), with elevation changes from downtown to river valley, possible coal
Above Grade Sections	No	Yes, through river valley
New Bridge(s) Required	No	3 +1 pedestrian. Also removal of Cloverdale footbridge req'd
Barricades at Intersections	Yes	Few + traffic signal controls
Train Style	Standard (high floor)	Urban low-floor LRT
Number New Cars	20	Unknown
Noise Walls Required	No	Yes, in some areas
Travel speed	Up to 70 km/hr (exist.)	At community traffic speeds
Park and Ride Sites	No	1
Maintenance and Car Staging Facilities	No	Yes, near Whitemud and Muttart Conservatory

Notes:

1 — Wagner. (There may also be upgrades at Churchill station, which is to be a shared station.) There are also maintenance and staging facilities required.

2 - An *Edmonton Sun* October 2014 article identified the cost at \$665 million, as does information currently (June 28, 2015) available on the City of Edmonton's website.

3 - In VL Fact Sheet 02-June-15, currently (June 28, 2015) available on the City of Edmonton website, titled "Valley Line – Stage 1 Mill Woods Town Centre to 102 Street", it states that "The Valley Line is estimated to be a \$1.8 billion project and has been made possible through key funding partnerships with the province of Alberta and Government of Canada ...". Per City of Edmonton website "Frequently Asked Questions Valley Line (SE to West LRT) dated September 2013. Specifically it is stated, "Construction costs for the Valley Line (SE to W LRT) project *are only known at a conceptual level and are subject to change*. The conceptual-level cost estimate for this project is \$3.2 billion." Presumably this also means the \$1.8 billion costs for the Mill Woods – 102 Street section are "only known at a conceptual level and subject to change."

Valley Line LRT Potential Cost from Extrapolation of Metro LRT Extension

Preamble

The following cost extrapolation is not meant as an accurate estimate but more to perform a benchmark cost comparison to an existing LRT project and thus some form of reality check on the costs presented by the City. As Table 1 shows, these two projects are not directly comparable. The Metro Line LRT Extension (MLE) has more full-size stations and more tunneling as a percentage of total length. The Valley Line LRT (VL) Phase 1 has a complex river valley crossing that includes some tunneling into potentially problematic areas and also includes planned removal of an existing footbridge and the construction of a new LRT/pedestrian footbridge. It also requires significant lengths of above grade track to get through the river valley and up Connors Road, including a pedestrian footbridge at Connors Road. There are also bridges identified over Argyll Road and Whitemud Drive. The Valley Line LRT also requires construction of maintenance and staging facilities. Both projects require extensive road construction and reconstruction work.

Cost Extrapolation of MLE to VL (Mill Woods to 102 Street only)

- MLE cost/km = \$665 million/3.3 km = \$201.5 million per km of track
- VL (not incl. annual cost inflation) = \$201.5M/km x 13.1 km = \$2,640 million
- Majority of MLE construction occurred between 2008*/2011 and 2013
 - * Tunneling under the Epcor building occurred in 2008, to save costs of doing later
- Proposed VL construction to occur between 2016 and 2020
- Therefore, apply an average 6 years of inflation at an average rate of 3%
- VL Potential Cost = \$2,640 million x 1.03⁶ = **~\$3.15 billion**
- **\$3.15 billion** is **75% higher** than the presented costs of \$1.8 billion.

Estimated Valley Line Capital Cost Burdens for Each Edmonton Household

If every household in Edmonton had to pay for their share of the project costs in cash, what would that look like? This section addresses that question to provide some financial perspective on the cost impact of this project by estimating the average cost of the Mill Woods to 102 Street (Phase 1) Valley Line LRT project, that each Edmonton household (of an average 2.5 persons) will be directly or indirectly burdened with. The simplified premise is that the portion of the project cost that the City of Edmonton (COE) is responsible for will filter down to the citizens of Edmonton one way or another directly through City taxes or fees and/or indirectly through higher rents and goods and services prices at Edmonton business that also pay municipal taxes. It also assumes that locally incurred City of Edmonton taxes and fees will be locally allocated. For example, a grocery store chain operating in Edmonton but also having operations and customers outside of

Edmonton may adjust local pricing to reflect local taxes and fees. In addition to municipal taxes and fees, the citizens of Edmonton also pay provincial taxes and federal taxes and a similar premise is applied to these portions of the costs. Therefore the calculations below estimate the additional pro-rated cost burdens to Edmonton citizens that will be eventually paid through their provincial and federal tax burdens. These have a lower impact on the costs borne by the citizens of Edmonton, because they are spread across much larger population bases. This simplified estimate also assumes the full costs are assigned to all (then current) citizens of Edmonton during the middle year (2018) of the project construction. This underestimates the ultimate cost because in reality, there are long-term debt servicing costs. Finally, these estimates only consider the project capital costs, not operating and maintenance costs. Hopefully the operating and maintenance costs would be fully covered by future user fees but it is not known if this will be the case.

Base Information:

- From VL Fact Sheet 02-June-15, currently (June 28, 2015) available on the City of Edmonton website – funding for the stated **\$1.8 billion** project is as follows:
 - **\$950 million** from City of Edmonton (tax paying citizens) comprised of \$800 million + another \$150 million in the form of a 10 year interest-free loan from the Province of Alberta.
 - **\$450 million** from Province of Alberta (taxpayers) comprised of \$300 million from Green Trip funding and \$150 million to match New Building Canada Plan funding. (\$150 million in the form of an interest-free loan is also being provided by the Province. This is included in City's \$950 million contribution, per above.)
 - **\$400 million** from Government of Canada comprised of \$250 million in PPP Canada funding, and \$150 million from the New Building Canada Plan fund.
- City of Edmonton Census 2014:
 - 2014 population is 877,926
 - Annual population growth has averaged approximately 30,000 since the last Municipal Census in 2012.
 - Therefore, the extrapolated population of Edmonton in 2018 (the middle year of the 2016-2020 VL project) is $877,926 + 4 \times 30,000 = \mathbf{997,926}$ = (approximately).
- From Alberta (and Canada) Quarterly Population Reports (1st Quarter 2015)
 - Alberta Population April 1, 2015 = 4,175,409
 - From the data, the future quarterly growth rate may be ~0.5%
 - Therefore the extrapolated population of Alberta on April 1, 2018 (the estimated mid-point of the construction of 2016 – 2020 VL project) = $4,175,409 \times 1.005^{12} = \mathbf{4,432,939}$ (approximately)
 - Canada Population April 1, 2015 = 35,749,600
 - From the data, the future quarterly growth rate may be ~0.25%
 - Therefore the extrapolated population of Canada on April 1, 2018 (the estimated mid-point of the construction of 2016 – 2020 VL project) = $35,749,600 \times 1.0025^{12} = \mathbf{36,836,958}$ (approximately)

- From Statistics Canada 2011 Census Report – Average number of persons per household in Edmonton = **2.5**
- Method of Calculation: Divide each of the total cost amounts (Municipal, Provincial, Federal) by the corresponding population to get average cost per capita, then multiply by the average number of persons per household.

1) Average Cost Burden (ACB) to each Edmonton household based on \$1.8 billion project cost provided by the City of Edmonton:

$$ACB_1 = (\$950,000,000 / 997,926) \times 2.5 + (\$450,000,000 / 4,432,939) \times 2.5 + (\$400,000,000 / 36,836,958) \times 2.5 = \$2,380 + \$254 + \$27 = \mathbf{\$2,661}$$

2) Average Cost Burden (ACB) to each Edmonton household based on \$3.15 billion potential project cost extrapolated from the MLE project, assuming that the City, Province, and Federal governments prorate the cost increases according to the original cost splits:

$$ACB_2 = ACB_1 \times \$3.15 \text{ billion} / \$1.8 \text{ billion} = \mathbf{\$4,657}$$

3) Average Cost Burden (ACB) to each Edmonton household based on \$3.15 billion potential project cost extrapolated from the MLE project, assuming that the City must cover all cost increases over the provided \$1.8 billion estimated cost and the provincial and federal governments will only pay the original amounts promised:

$$ACB_3 = ((\$950,000,000 + (\$3,150,000,000 - \$1,800,000,000)) / 997,926) \times 2.5 + (\$450,000,000 / 4,432,939) \times 2.5 + (\$400,000,000 / 36,836,958) \times 2.5 = \$5,762 + \$254 + \$27 = \mathbf{\$6,043}$$

Summary

A simple extrapolation of the Metro Line Extension LRT project cost suggests that the Valley Line LRT costs may potentially be in the order of 75% higher than the presented costs of \$1.8 billion. This is a significant enough difference to warrant questions on the accuracy of the presented costs which were stated by the City of Edmonton in a September 2013 publication to be “only known at a conceptual level and are subject to change.” More concerning than this benchmark comparison to the MLE are reports that the COE is discussing potential scope additions to the project such as a tunnel or crossing over 82 Avenue and increasing (traffic) capacity on other routes. There are also potential risks for the tunneled section of the route through the north bank of the river valley crossing. The City has not indicated how any potential cost overruns will be funded by the various levels of government, which is of great interest to Edmonton taxpayers if there are overruns.

Depending on whether or not the “conceptual level” costs presented by the City are accurate, and how any cost overruns will be funded, a simple estimate of the Average Cost Burden (ACB) exceeds \$2,600 per Edmonton household of average 2.5 persons for only Phase 1 of the Valley Line LRT project. This simple estimate of ACB does not include long-term debt servicing costs, which will be required.

Before the City of Edmonton and the Province of Alberta fully commit to the Valley Line LRT project, Edmonton and Alberta taxpayers deserve to know that the cost forecasts are accurate, what the project cost will mean to their future tax obligations, and that thorough and objective studies, including assessments of alternatives, have been completed to ensure that their hard-earned income is being spent efficiently and prudently.

Disclaimer:

All financial cost estimates and impacts discussed in this document are presented as high level “for discussion” estimates or impacts. Their accuracy depends on the accuracy of the assumptions applied and the accuracy of available on-line or published information. The assumptions used are believed to be reasonable and efforts were made to ensure all information was obtained from reliable sources. Even so, the cost estimates and impacts within are not represented as and should not be construed as being highly accurate or precise estimates or impacts. If the City of Edmonton disagrees with any of the presented financial information, they are respectfully invited to provide their own financial information, estimates or impacts for discussion or post them on their website to better support full cost transparency for the citizens of Edmonton on this project.