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Mr. David Estrin

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**Subject: Detroit River International Crossing, Proposed Highway 401 along Talbot /
Huron Church Road Corridor, GreenLink
Economic and Fiscal Impact Analysis**

Dear Mr. Estrin,

Based on a request from the City of Windsor PB was asked to assess the economic and fiscal impacts of the GreenLink during its construction and its operation.

The results indicates that during construction 19,000 new person/year jobs will be generated in the Windsor region over the construction duration of six years with an increase in total earnings for all sectors of approximately \$1.9B in the region. This will result in over \$105M increase in Provincial taxes with potential tax revenue to Windsor in the order of \$2.7M. During the life cycle of the facility, it is expected that 217 additional jobs will be generated on a yearly basis (although the facility would require much lower number of maintenance staff) with an increase in annual payroll earnings of over \$11M in the region.

In summary, the GreenLink has direct, indirect and induced economic and fiscal effects that continue over the lifetime of the facility and contribute millions of dollars to the local economy over the full life cycle of the project. In addition, the project will contribute substantially to the total tax base, and to Provincial tax revenues. Those tax revenues, while not a direct revenue source for Windsor, can be expected to result in increased grants-in-aid from Ontario to Windsor, via the various revenue sharing and other local grant programs administered by the Provincial Government.

The following is detailed evaluation of this study.

Overview

The economic analysis estimates the impact of the GreenLink on total Windsor income and employment. The fiscal analysis, which is based directly on the economic impact analysis, estimates increases in Ontario Province tax revenues arising from that economic activity, including provincial sales and income taxes, and allocates a portion of those revenues to the City of Windsor, based on population.

The analysis includes initial impacts due to construction of the project as well as yearly impacts from operation and maintenance of the facility. In order to estimate the total direct and indirect impact, input-output multipliers obtained from Statistics Canada for Windsor were applied to the direct impacts. . No attempt is made here to forecast the longer term impacts of the project on development in the surrounding area, and in this sense, the analysis may be regarded as conservative in its assessment of benefits. It is reasonable to assume, however, that the GreenLink will enhance the development climate of the area.

This report uses PB's estimated capital construction cost over the 6 years duration of construction and the annual operation and maintenance (O&M) cost estimate over the lifecycle of the GreenLink facility to determine the economic and fiscal impacts of the project on Windsor, Ontario.

The methodology and results are described below. The first section describes the impacts of construction spending on employment, earnings, and tax revenues, which occur over the six years construction duration. The second section describes the on-going annual impacts on employment, earnings, and tax revenues from O&M spending.

IMPACTS OF CONSTRUCTION SPENDING

1. Determining Within-Region Share of Capital Construction Spending

Since not all material purchases for construction would be derived from within the region, it was necessary to separate the share of within-region purchases. Out-of- region purchases would not represent an additional infusion of economic activity for the region, and therefore are excluded from the computations. For example, some materials (steel and some construction equipment leases) would be purchased from suppliers outside of the region. All labour is assumed to be obtained from local and regional labour pools. Accordingly, the capital costs are divided into three categories: labour, equipment, and materials. Materials were then further divided into more specific categories.

For labour, the estimated person-years required for the construction were directly estimated from the construction cost estimate prepared by PB. Various assumptions were made

regarding in-region purchase shares for various construction cost categories. Basic assumptions are as follows:

1. 100 percent of labour would be obtained from within the region.
2. 50 percent of equipment purchases (including lease costs) would come from the region.
3. Materials and supplies were disaggregated into three categories: steel, concrete and other. It was assumed that all of the poured concrete would come from within the region, none of the steel would come from within the region, and 50% of the remaining materials would come from within the region.

The direct, in-region, construction outlays for labour, equipment, and materials and supplies are summarized in Table 1. The table also includes the associated direct construction employment for the project, in person years of employment.

Cost Category	In-Region Purchases and Outlays (millions)	Direct Construction Employment (person years)
Construction Labour	\$768	6,760
Equipment	\$404	N/A
Materials and Supplies	\$81.2	N/A

Table 1: In-Region Final Demand (Outlays) for Project Capital Construction and Associated Construction Employment

2. Estimate Change In Total Earnings And Employment, Including Direct, Indirect, and Induced Earnings and Employment

With a project of this size and scope, direct spending on construction materials and supplies, as well as construction employment and associated wages paid to construction workers, together generate multiple rounds of spending which ripple throughout the economy. For example, when contractors purchase cement from local suppliers, those suppliers must in turn purchase raw materials, transportation services, accounting services, etc. The cement suppliers also pay their own workers, who (like the construction workers) purchase goods and services within the local economy. Such multiple rounds of “interindustry” purchases (including household spending by wage earners) result in total economic activity which is a multiple of the direct, first round of spending. These multiplier effects, which are

mathematically derived from an input output (I/O) model, are the basis for the regional economic multipliers used in this analysis.

Using the input output multipliers, changes in total earnings and employment (including both direct and multiplier effects) within the region were calculated. The results are summarized in Table 2 below. It is important to emphasize that the total employment and earnings shown in Table 2 reflects the sum of direct construction worker employment and wages and indirectly generated employment and wages resulting from the multiplier effects. Thus, total employment and earnings span multiple economic sectors, such as retailing, transportation services, other business services, and other sectors. The expansive nature of the economic effects, spanning multiple sectors, indicates that the project’s benefits extend beyond the construction industry, cycling through the entire regional economy and dispersing benefits to a wide range of businesses and households.

Cost Category	Change, Total Earnings (millions)	Change, Total Employment
Labour	\$1740	15,900
Equipment	\$105	2,220
Materials and Supplies	\$42	890
Total	\$1,887	19,010

Table 2: Change in Total Earnings and Employment (based on Statistics Canada multipliers for Ontario Province)¹

¹ Statistics Canada multipliers for Ontario were applied to the equipment, materials and supplies components of the Windsor GreenLink construction project costs. These multipliers are substantially lower than regional economic multipliers typically reported by the U.S. Bureau of Economic RIMS II data base for virtually all states and regions in the United States. It is the view of the PB economics group that the Ontario multipliers understate the indirect and induced economic impacts of construction projects. Because the Ontario multipliers reflect only the impacts within Canada, the lower than normal multipliers may be attributed to cross-border effects – that is, because population and economic activity are concentrated close to the U.S. border, some of the economic multiplier effects may spill over (i.e., be “lost”) to producers in the U.S. This would be the case for Windsor, which is proximate to and closely linked with the Detroit metropolitan region and its economic base. These spillover effects are confined largely to materials and supplies – labour pools are assumed to be drawn largely from Ontario.

3. Estimate Change in Provincial Tax Revenue

Using the total increase in regional employment and earnings estimated above, as well as the total increases in regional spending for construction materials, the increase in income tax revenue and provincial sales tax revenue in Ontario were calculated.

The increase in sales tax revenue is divided into two parts: 1) taxes from increased spending due to changes in wage income and thus increases in household consumption; and 2) taxes from the sale of construction supplies to build the project.

An estimation of the provincial income tax revenue was calculated using the average income of an Ontario resident². Assuming no exemptions and the tax rate for an individual, the total income tax per individual was calculated. See Table 3. The individual tax was multiplied by the total change in employment as calculated in step 2 above. The result is the total change in income tax revenue for Ontario.

The increase in sales tax revenue from household consumption assumes a household spending rate of 80% of annual gross income. This was applied to the total income and total change in employment calculated above. The third column of Table 3 is the revenue generated from increased spending on construction materials.

Change in Total Income Taxes (millions)	Increase in Sales Tax Revenue from Household Consumption (millions)	Extra Sales Tax Revenue from Materials (millions)
\$ 49.5	\$ 49.4	\$ 6.50

Table 3: Change in Provincial Taxes

4. Estimate Share of Provincial Tax Revenues Redistributed to Windsor

The province of Ontario distributes money to Windsor through a variety of channels including the Ontario Municipal Partnership Fund (OMPF), transportation grants, public health benefit grants, provincial gas tax revenue, and others. Due to the complexity of provincial funds distribution we assumed that Ontario distributes revenues equally per capita throughout the province. This is through both direct grants and indirect benefits of province-wide spending. Given the 2007 population of Ontario and the 2007 population of Windsor,

² Income taxes are based on the average annual salary of a worker in Ontario, Canada in 2007 from Statistics, Canada: \$40,665.05 (2006\$). Income taxes are calculated using 2007 tax rates and assume an individual tax rate with no exemptions.

the share of provincial tax revenue going to the city of Windsor is 2.59%³. Table 4 summarizes the share of provincial tax revenues seen by Windsor.

Change in Total Income Taxes (thousands)	Increase in Sales Tax Revenue from Household Consumption (thousands)	Extra Sales Tax Revenue from Materials (thousands)
\$ 1,280,000	\$ 1,280,000	169,000

Table 4: Windsor Share of Provincial Tax Revenue from Construction Spending

IMPACTS OF OPERATION AND MAINTENANCE (O&M) SPENDING

The methodology for estimating impacts of O&M spending are directly comparable to the process for estimating impacts from construction spending: in region shares are estimated; total direct, indirect and induced impacts on employment, earnings and consumption are estimated; Provincial income and sales taxes revenues are estimated, and a local tax revenue share is estimated.

1. Determining Regional Share of O&M Costs and Labour

For O&M, it is reasonable to assume that 100 percent of the labour and extra expenditures for equipment rental and materials would be from within the region. From PB’s estimated O&M cost, the total regional contribution in earnings and employment is calculated and shown in Table 5 below.

Cost Category	In-Region Purchases and Outlays (millions)	In Region Annual Maintenance Employment
Maintenance	\$ 12	70
Operation	\$ 2.2	36

Table 5: Total Regional Demand for Outlays and Employment for O&M

³ Population estimates are from Statistics Canada, 2007.

2. Estimate Change in Total Earnings and Employment, Including Direct, Indirect, and Induced Earnings and Employment

The same input-output multipliers that were used to estimate earnings and employment for capital costs are used to calculate direct, indirect, and induced effects of the O&M earnings and employment. The results are shown in Table 6. It is noted that maintenance and operation of GreenLink would require much less staff than indicated here as total employment since this estimate reflects direct, indirect, and induced employments in all sectors.

Cost Category	Change, Total Earnings (millions)	Change, Total Employment
Maintenance	\$ 6.21	132
Operation	\$ 4.96	85

Table 6: Total Earnings and Employment for O&M

3. Estimate Changes in Provincial Tax Revenue

The changes in provincial tax revenues from O&M are calculated in the same way as the provincial tax revenues from capital costs. In other words, the same income per individual is assumed, the same consumption rate per household, and the same applicable taxes. The results are in Table 7.

Cost Category	Change, Total Income Taxes (thousands)	Extra Sales Tax Revenue from Consumption (thousands)
Operation and Maintenance	\$564,000	\$ 564,000

Table 7: Provincial Tax Revenues from O&M

4. Estimate Share of Provincial Tax Revenues Redistributed to Windsor

The same method that is used to calculate the proportion of provincial tax revenues going to Windsor, Canada above is used here. Ontario is assumed to distribute provincial tax revenue equally per capita throughout the province, resulting in 2.59% redistributed to Windsor. Table 8 summarizes the share of provincial tax revenues from O&M redistributed to Windsor.

Cost Category	Change, Total Income Taxes (thousands)	Extra Sales Tax Revenue from Consumption (thousands)
Operation and Maintenance	\$ 14.6	\$14.6

Table 8: Windsor Share of Provincial Tax Revenue from O&M

Conclusion

The total fiscal impacts of the GreenLink are summarized in Tables 9 and 10. Note that the capital construction impacts (Table 9) are a total amount for the six-years of construction and the O&M costs (Table 10) are given as yearly impacts on the local economy. As noted earlier, the employment and earnings shown in the table are the sum of both direct employment associated with construction and maintenance and operating GreenLink, as well as the employment across multiple economic sectors which would be indirectly created as a result of multiplier effects.

Impacts from Construction	Amount (total over 6 yrs)
Tax Revenue Impacts	
Provincial tax revenue increase	\$ 105,400,000
Estimated Windsor share	\$2,729,000
Regional Employment and Earnings Impacts	
Increase in total earnings (all sectors)	\$ 1,890,000,000
Increase in total employment (all sectors)	19,000

Table 9: Construction Impacts Summary

Impacts From O& M	Amount (per year)
Tax Revenue Impacts	
Provincial tax revenue increase per year	\$ 1,130,000
Estimated Windsor share	\$29,200
Regional Employment and Earnings Impacts	
Yearly Change in total earnings from O&M (all sectors)	\$ 11,200,000
Yearly Change in total employment (all sectors)	217

Table 10: O&M Impacts Summary

In summary, the GreenLink has direct, indirect and induced economic and fiscal benefits that continue over the lifetime of the facility and contribute millions of dollars to the local economy during construction and over its full life cycle. In addition, the project will contribute substantially to the total tax base, and to Provincial tax revenues. Those tax revenues, while not a direct revenue source for Windsor, it can be expected to result in increased grants-in-aid from Ontario to Windsor, via the various revenue sharing and other local grant programs administered by the Provincial Government.

Assumptions for Windsor's GreenLink Economic Analysis

Impacts of Construction Spending:

- 1) 100% of labour for the construction is from within the region of interest.
- 2) 50% of equipment purchases (including lease costs) come from within the region and the rest from outside.
- 3) Materials were divided into three categories: poured concrete, steel, and 'other'. 100% of the concrete came from within the region, 0% of the steel, and 50% of the 'other' materials.

Tax Revenue Calculations:

- 4) Jobs created from the input-output multipliers (including the construction jobs) earn the average wage of an Ontario resident: \$40,665.05 (Statistics Canada, 2006).
- 5) Income taxes are calculated assuming current Ontario provincial tax rates (Canada Revenue Agency, Provincial/territorial tax rates for 2008). The taxes are calculated assuming average income of an Ontario resident and persons filing as individuals with no exemptions.
- 6) Ontario Provincial Sales Tax (PST) is 8% (Ministry of Revenue).
- 7) Based on recent economic data, households have a consumption rate of 80% of their gross money earnings (US BEA).
- 8) Ontario distributes its provincial tax revenues equally per capita. The current population of Ontario is 12,804,000 ("Population by year, by province, and territory", Statistics Canada, 2007) and the current population of Windsor, Canada is 331,100 ("Population of census metropolitan areas (2001 Census boundaries)", 2007). The resulting proportion of Ontario tax revenue for Windsor is 2.59%.

If I can be of further assistance please advise.

Very truly yours



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