



**DRAFT**



Waverley Road - Spry to Quinn.xls

## Calculating Schedule C Benefits Project #1 Road Resurfacing - mill & overlay

### Definitions

|  |   |
|--|---|
|  | input field                               |
|  | calculated field (no data entry required) |

AADT = Average Annual Daily Traffic

RCR = Ride Comfort Rating

MJ = mega joules

### Assumptions

- milling of existing asphalt surface full width of pavement to a depth of 90mm
- surfacing with 2 lifts of hot mix asphalt to a depth of 90mm
- base lift of hot mix asphalt contains RAP

### Project Description

|   |      |                |
|---|------|----------------|
| project length                                  | 410  | m              |
| width of pavement                               | 9.8  | m              |
| intersections (and areas not included in above) | 0    | m <sup>2</sup> |
| Total Project Area                              | 4018 | m <sup>2</sup> |
| current traffic volume (actual or estimated)    | 7540 | AADT           |
| % light trucks (pickup)                         | 0    | %              |
| % trucks (heavy truck)                          | 5    | %              |
| % trucks (tractor/trailer)                      | 0    | %              |
| % trucks (B trains)                             | 0    | %              |
| pavement smoothness                             | 7    | RCR            |

### Current CO<sub>2</sub> Emissions

|                         |       |        |
|-------------------------|-------|--------|
| Total Current Emissions | 699.6 | kg/day |
|-------------------------|-------|--------|

NOTE: Based on Natural Resources Canada - 2.36Kg/L CO<sub>2</sub> Gasoline, 2.73kg/L CO<sub>2</sub> Diesel and Transport Canada - Company Average Fuel Consumption 2004



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## Energy Used For Construction

|   |                  |                |
|---|------------------|----------------|
| milling of existing asphalt surface                           | 4018             | m <sup>2</sup> |
| trucking of milled asphalt (distance to dump site and return) | 20               | km             |
| base lift of Hot Mix Asphalt with RAP                         | 0                | mm             |
| % RAP   | 20               | %              |
| Surface lift of Hot Mix Asphalt                               | 50               | mm             |
| <b>Total MJ of energy required for project</b>                | <b>339,927.2</b> | <b>MJ</b>      |

NOTE: Natural Resources Canada - Road Rehabilitation Energy Reduction Guide for Canadian Road Builders 2005, IVL Swedish Environmental Research Institute - Lifecycle Assessment of Road, March 2001

## Benefits

Maintaining this road with a smooth surface condition reduces emissions

|   |        |         |
|---|--------|---------|
| pavement smoothness (on the above project length)   | 10     | RCR     |
| Total Emissions (on the above project length if pavement maintained with a smooth riding surface) | 679.3  | kg/day  |
| Reduction in CO <sub>2</sub>  | 20.3   | kg/day  |
|   | 7402.0 | kg/year |

Resurfacing at appropriate lifecycle to maintain the road with a smooth surface can reduce the total energy required as the pavement will require less work to rehabilitate. For example: instead of double lift of hot mix asphalt a single lift may be all that is required to maintain a smooth surface

|  |                  |                |
|--|------------------|----------------|
| milling of existing asphalt surface                            | 4018             | m <sup>2</sup> |
| trucking of milled asphalt (distance to dump site and return)  | 20               | km             |
| Surface lift of Hot Mix Asphalt                                | 40               | mm             |
| <b>Total MJ of energy required for single lift resurfacing</b> | <b>272,080.9</b> | <b>MJ</b>      |
| <b>Reduced Energy requirements</b>                             | <b>67,846.3</b>  | <b>MJ</b>      |