March 21, 2006

To: Transportation Association of Canada
Re: Environmental Achievement Award Application 2006
From: Ross Fromhart
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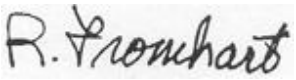
Please find attached my application for the Environmental Achievement Award for Roadbase reconsolidation. A brief project overview is below followed by a detailed report outlining the environmental benefits of the project.

Project overview:
Roadbase reconsolidation retains old pavement and roadbed gravel, compacting both into consolidation with sublayer soil, requiring less gravel to restore road surface. Crumbled pavement fragments are shielded from leaching into groundwater, by the layer of new pavement

Regards,



Ross Fromhart

Protection and Enhancement of the Environment:
Roadbase reconsolidation protects and enhances the environment in the following ways:

1. Reduction of excavation and protection of groundwater
Traditional roadbed excavation wastes 5,400 cubic metres/km of old pavement, roadbed gravel and sublayer soil into disposal areas, where pavement asphalt content is leachable into groundwater.

By contrast, roadbase reconsolidation retains old pavement and roadbed gravel, compacting both into consolidation with sublayer soil. Crumbled pavement fragments are shielded from leaching into groundwater, by the layer of new pavement.

2. Eliminates coarse gravel for backfill
Traditional roadbed excavation requires 4500cu.m backfill of coarse gravel and 1000cu.m of crushed gravel to restore the road surface.

In recycling old pavement and roadbed gravel in sublayer soil, roadbase reconsolidation uses 1000cu.m crushed gravel to restore road surface.

3. Reduces fuel consumption and exhaust emissions
Roadbed reconstruction requires 1,644 machine-hours/km as compared with 564 machine-hours/km for roadbase reconsolidation, a reduction of 65% machine-hours. Less machine-hours reduce fuel use and exhaust emissions.

4. Conserves gravel stocks, eliminates disposal sites
By retaining roadbed gravel and pavement in a reconsolidated roadbase, gravel stocks are conserved and disposal sites are eliminated.

5. Improved service life without repair
The average life of pavement under traditional roadbed reconstruction methods is 5-10 years as compared with more than 21 years with reconsolidated roadbase.

Financial Implications

Roadbase reconsolidation protects and enhances the environment and is more cost effective than traditional roadbed reconstruction.

Savings are detailed as follows:

Cost per km	Reconstruction	Reconsolidation	Savings
Backfill	67,500	17,735	$49,765
Operating costs of machines	46,035	17,237	$28,798
Totals	$113,535	$34,972	$78,563

1. Backfill requirements

Traditional roadbed excavation requires 4,500 cubic metres of coarse gravel backfill at a cost of $15.00/cu.m. Since roadbase reconsolidation recycles old pavement and roadbed gravel, no additional coarse gravel is required.

Traditional roadbed excavation requires 1,000cu.m of crushed gravel at a cost of $17.75/cu.m, and roadbase reconsolidation also requires 1,000cu.m of crushed gravel.

Roadbase reconsolidation results in a saving of $49,765 relating to backfill/km.

2. Operating costs of machinery

Traditional roadbed excavation uses 1,644 machine-hours/km as compared with 546 machine-hours by the roadbase reconsolidation method. Assuming a machinery operating cost of $72.75/hour, this produces a savings of $78,570/km.

3. Roadbase durability

Reconsolidation has extended pavement service life without repairs to 21+ years, to augment funding for future improvement.

Degree of Innovation

Development of method and invention (TM; Patent) to reconsolidate roadbases, derived from three projects that crumbled pavement into fragments, mixed fragments with roadbed gravel and compacted both into consolidation with sublayer soils of varying densities and permeability:

1. The grading and compacting of gravel ramps 2 x 243m, directly on a rural road to connect to a freeway overpass, disclosed the displacement of gravel into sublayer soils, and suggested a concept of reconsolidation.

2. Entrance road 340m to an agricultural research centre, was reconsolidated and confirmed the concept.

3. Regional district (county) road 956m by reconsolidation reduced gravel, machine time, fuel and exhaust emissions, and proved the concept as a method.

Overall applicability to Other TAC Members

The method of roadbase reconsolidation is applicable to maintainers of:

1. Secondary highways
2. Prairie grain haul roads
3. Collector roads
4. Rural roads
5. Government roads: parks, prisons, military
6. Loading yards: modular transfer
7. Freeway: ‘on’, ‘off’ ramps