

March 4, 2011

Mr. Kevin Lacy
200 Barrington Street
Suite 1302
Halifax, NS B3K 3K1

Dear Mr. Lacy:

RE: Freedom of Information and Protection of Privacy Act application # TIR-11-12

I am writing with respect to your request for information under the *Freedom of Information and Protection of Privacy Act* which was received in this office on February 14, 2011. Your request reads as follows:

"The business plan and cost calculations for the set up of a gov't run paving program."

Access has been granted in part to these records. The records you requested would contain information exempt from disclosure under Sections 13(1); 14(1); 17(1)(b)(c)(d)(e); 20(1) of the *Act*.

Section 13(1) The head of a public body may refuse to disclose to an applicant information that would reveal the substance of deliberation of the Executive Council or any of its committees, including any advice, recommendations, policy considerations or draft legislation or regulations submitted or prepared for submission to the Executive Council or any of its committees.

Section 14(1) The head of a public body may refuse to disclose to an applicant information that would reveal advice, recommendations or draft regulations developed by or for a public body or a minister

Section 17(1)(b)(c)(d)(e) The head of a public body may refuse to disclose to an applicant information the disclosure of which could reasonably be expected to harm the financial or economic interests of a public body or the Government of Nova Scotia or the ability of the Government to manage the economy and, without restricting the generality of the foregoing, may refuse to disclose the following information:

(b) financial, commercial, scientific or technical information that belongs to a public body or to the Government of Nova Scotia and that has, or is reasonably likely to have, monetary value;

(c) plans that relate to the management of personnel of or the administration of a public body and that have not yet been implemented or made public;

(d) The head of a public body may refuse to disclose to an applicant information; the disclosure of which could reasonably be expected to result in the premature disclosure of a proposal or project or in undue financial loss or gain to a third party

(e) information about negotiations carried on by or for a public body or the Government of Nova Scotia.

Section 20(1) The head of a public body shall refuse to disclose personal information to an applicant if the disclosure would be an unreasonable invasion of a third party's personal privacy.

As a result, information falling into these categories have been severed from the file prior to disclosing it to you.

You have the right to request a review of this decision by the Review Officer appointed pursuant to the Act. The review must be filed, in writing (see attached Form 7), within sixty (60) days of receiving this letter to: Review Officer, Freedom of Information and Protection of Privacy, P.O. Box 181, Halifax, Nova Scotia B3J 2M4.

If you have any questions please do not hesitate to contact me.

Sincerely,



Erna Slingluff
IAP Administrator

Attachment

Form 7 Request for Review

**Province of Nova Scotia
Freedom of Information and Protection of Privacy Act
Subsection 32(1)
(Applicant)**

TO: The Review Officer
P.O. Box 181
Halifax, NS B3J 2M4

1. This Request for Review arises out of an Application for Access to a Record or Request for Correction of Personal Information submitted to _____ (*specify public body*) on the _____ day of _____, 200____, a copy of which Application or Request is attached to this Request for Review.

2. The applicant requests that the review officer review the following decision, act or failure to act of the head of the public body;

Check where applicable

____ (a) decision dated or made on the _____ day of _____, 200____, a copy of which is attached to this Request for Review;

____ (b) (*specify act or failure to act*) _____

3. The applicant requests that the review officer recommend that

Check where applicable

____ (a) the head of the public body give access to the record as requested in the Application for Access to a Record;

____ (b) the head of the public body correct the personal information as requested in the Request for Correction of Personal Information;

____ (b)[c] (*specify other recommendation or recommendations, if any, you consider appropriate*)

Date: _____

Provincial Chip Seal Operation

Prepared by: B. Baillie, P.Eng.
for
S. Bruce Fitzner, MPA, P.Eng.
Chief Engineer Highway Programs

20 May 2010

Table of Contents

Executive Summary.....	3
Introduction to Proposal.....	5
Local Road Stabilization Program	
Opportunity/Issue.....	5
Analysis and Discussion.....	7
Pavement Preservation Program	
Opportunity/Issue.....	10
Analysis and Discussion.....	11
TIR Provincial Chip Seal Crew	
Opportunity/Issue.....	14
Analysis and Discussion.....	16
Risk Assessment.....	20
Recommendations.....	22
Recommended Implementation.....	22
Appendix "A".....	24

Executive Summary

Nova Scotia has one of the highest percentages of paved roads in Canada, 61%; only two other provinces in Canada, PEI (70.8%) and BC (67.8%) have a higher percentage of paved roads. The province has 14,000 kilometres of paved roads to maintain. In order to properly maintain the existing paved road system, approximately 680 km should be repaved each year. At the average level of 500 kms repaving per year (2006-2009), there is a gap of 180 km per year. As is it not anticipated funding levels will increase significantly in future budgets, the maintenance of the paved roads is not sustainable and the infrastructure deficit will continue to grow. Some other alternatives must be explored to preserve and rehabilitate these roads.

Transportation and Infrastructure Renewal proposes to introduce a road stabilization program using surface treatments such as double chip seal instead of asphalt pavement to preserve and rehabilitate some of the roads. Most of the local paved roads will not be repaved for many years to come, if ever, based on the current and foreseeable budgets. Low volume local paved roads meeting certain criteria would be pulverized and double chip sealed, providing residents with a smooth riding surface and improving the level of service. This could apply to approximately 1/3 or approximately 2000 km of existing local paved roads. Double chip sealing these roads would result in the overall inventory of paved roads reduced. New requests for paving of low volume local roads would also be assessed for double chip seal surface treatment as opposed to paving with asphalt.

Savings in the vicinity of \$2.9 million per year (TCA) can be expected through this change.

There are not expected to be any operational budget savings as reseals are operating, rather than capital (TCA) costs under NS's accounting treatments, the reseals will, however, be substantially offset by operational cost savings for winter maintenance and patching savings resulting in no request for any additional operational funds.

TIR also proposes to expand its pavement preservation program by chip sealing paved roads in fair to good condition to extend the life of the asphalt. Pavement preservation is a much more cost effective method to manage the paved road inventory. Many studies have shown that every dollar spent in preventative maintenance such as chip sealing roads can save government \$6 - \$14 in future rehabilitation or reconstruction costs, (National Centre for pavement Preservation). Protecting our infrastructure investment is paramount if Nova Scotia ever hopes to bring the majority of the paved roads to a standard acceptable to the residents. Preventative maintenance such as chip sealing paved roads protects our investment and results in lower overall costs to maintain the roads.

S.14 - advice
 S.17(1)(b)(d)
 (e)
 - financial
 predictions
 - premature
 disclosure
 - negotiation

In order to support the road stabilization program and the increase in surface treatments, the Department would establish a chip seal operation.

S. 13 (1)
S. 14 (1)
Budget
Publications

A provincial chip seal crew would assist the government in reaching this objective.

Financial analysis shown later in this report illustrates that TIR can do the double chip seal work for 44% of the tendered price and resurfacing of paved roads with chip seal for 57% of the current tender prices. This is a significant savings and will allow TIR to do more work with the available funding.

S. 14
S. 17 (1) (b) (d) (e)

In addition the expanded single seal pavement preservation program that is necessary to provide the critical mass for the departmental chip seal will allow the pavement preservation program to match the repaving program (on a km to km basis) resulting the postponement/avoidance of significant TCA costs in the future.

The chip seal crew has many benefits in addition to addressing the condition of local low volume paved roads and the preservation of the paved roadways. The chip seal crew would employ approximately 26 people.

S. 17 (1) (b) (c) (d)
Financial Management
Preservation of Infrastructure

This would spread the economic impact of the work across the province.

Another benefit is better utilization of TIR equipment. The complement of equipment required by TIR is mainly driven by winter requirements. Some of this equipment sits idle in the summer as there is not enough funding to operate the equipment. By only purchasing the specialized equipment required for the chip seal operation, utilization of existing department equipment will increase.

The chip seal operation would require \$8 M of work each year, which would be funded from the existing Highway Construction program (both TCA and operating components). TIR's goal would be to chip seal approximately 360 km of roads per year. The total cost to outfit a chip seal operation is \$2.6M. In order to be operational for the 2011/2012 construction season, TIR would require the approval to proceed by spring 2010. Based on expected pricing the chip seal crew would provide a savings or reinvestment opportunity of about 28% (\$ 2.2 million) of which approximately 37% (\$0.82 m) would be TCA and 63% (\$1.4 m) would be operating on an annual basis. The expected savings of \$0.82m (TCA) annually would result in a pay-back period of 3 years to recover the \$2.6 m TCA cost of the new chip seal equipment.

In summary, the chip sealing operation would improve the overall sustainability of the paved road network, increase the level of service of roads pulverized and double chip sealed, allow funding to be directed to other maintenance activities through a reduction in the need to asphalt patch the badly deteriorated paved local roads, increase employment by 26 (seasonal and year around) and provide better utilization of department equipment.

Introduction to proposal

There are three separate components of the proposal being described in this document all related to chip seal programs. The first is (1) Local Road Stabilization for low volume (<500 vehicles per day) paved roads and gravel roads; the second is (2) Pavement Preservation for existing paved roads on our secondary road system; and the third is (3) Establishing a Provincial Chip Seal Operation in order to lower overall costs currently experienced through contracting out of this work. While it is not necessary to implement all three components in order to achieve costs savings and value, the best overall value and the most savings will be achieved if all three components proceed consecutively. The components will be discussed separately through business case elements 1 through 8, and then together for elements 9 through 11.

Local Road Stabilization Program

1. Opportunity / Issue:

Transportation and Infrastructure Renewal proposes to introduce a road stabilization program using surface treatments such as double chip seal instead of asphalt pavement to preserve and rehabilitate some of the local paved roads. A recommended treatment for low volume (< 500vpd) local paved roads which have deteriorated significantly is to pulverize and apply a surface treatment of double chip seal. New requests for paving of low volume local roads would also be assessed for double chip seal surface treatment as opposed to an asphalt surface.

2. Scope of Opportunity:

The road stabilization program will include low volume (< 500vpd) local paved roads in poor condition, approximately 1/3 or approximately 2000 km of existing local paved roads. In addition there are almost 9000 km of gravel roads, those of which have which have no heavy truck traffic and traffic volumes of under 500 vehicles per day (the majority) could also be considered for double chip seal rather than paving.

Prioritization for the road stabilization program will be based on requests compiled provincially for 'repaving' of low volume paved roads and paving of low volume gravel roads. Local knowledge of local TIR staff is also required to determine suitable candidates as the provincial road inventory list does not contain all the information required to assess suitable candidates. Information required includes traffic counts, heavy truck traffic, condition of the road, community input, roadside development and special features.

For the road stabilization program, pulverizing (for paved roads), ditching, culverts and gravelling would be completed by either local TIR forces or tendered under the TCA capital program or the Rural Impact Mitigation (RIM) program.

3. Project Objectives:

The introduction of a road stabilization program using double chip seal instead of asphalt pavement will permit the rehabilitation of low volume paved roads in poor condition and provide an alternative to asphalt paving for gravel roads. The operation will also allow TIR to introduce a pavement preservation program thus increasing the sustainability of secondary roads. TIR proposes to establish a TIR chip seal operation to do this work with the associated \$8 M increase in funding.

Pulverizing and double chip sealing the badly deteriorated local paved roads will eliminate the need to asphalt patch these roads (significant costs involved) and allow maintenance funding to be directed to other maintenance activities. Maintenance budgets are stretched and local crews do their best to patch badly deteriorated local paved roads. The asphalt patching performed keeps the roads barely serviceable for a year or two but the road is still a deteriorated road. This maintenance money is better directed to other activities which provide a lasting benefit. Roads rehabilitated with double chip seal will be less expensive to maintain and provide the residents with a significantly improved driving surface as compared to the existing road.

In recent years, there has been minimal paving of gravel roads as available funding has been directed primarily to maintain the higher volume 100 series roads and trunks and routes. There exists a pent up demand for paving of local roads. Requests for paving gravel roads increase each year and there is currently no program in place to address these requests. Double chip sealing can be completed for approximately 50 % of the cost of paving a road. Applying double chip seal to gravel roads provide the residents with a smooth driving service and an increase in the level of service as well as lower maintenance costs for TIR.

Background:

Between 1970 and 1990, hundreds of kilometres of local gravel roads were paved. Many of these roads were low volume roads and below the warrants (>500 vpd) to justify the cost benefit of paving. No additional operational funding was allocated to maintain the growing inventory paved roads. The result is that hundreds of kilometres of secondary paved roads have now deteriorated below acceptable conditions with approximately 50% of existing routes and local pavements greater than 20 years old. The gap continues to grow every year.

S.14
S.17(1)(b)
(d) (e)

- Financial
- Budgeting process is under negotiation, no schedule done yet.
- premature disclosure

Analysis and Discussion:

1. Financial Benefits:

In regards to the proposed road stabilization program, funding will start to address the growing list of repaving requests for low volume local roads and assist in rehabilitating low volume paved roads, i.e., pulverizing the asphalt and double chip sealing the road. This will provide the residents with a better quality road and redirect maintenance dollars to improve other services.

The payback period for this investment can be categorized as both short and long term. In regards to the double chip seal program, pulverizing and double chip sealing low volume paved roads will have an immediate return for the Department. A disproportional percentage of maintenance budgets are spent on trying to patch the badly deteriorated paved local roads and the end result is still a deteriorated paved local road. Providing a double chip seal surface will free up the patching money for other maintenance activities which provide a better level of service on all roads. There will also be a saving in salt in the winter. The deteriorated roads usually require more salt because of the deformations; the salt brine does not spread but pools in the potholes and deformations so salt must be broadcast over the entire road. The new double chip seal road is not salted in the winter, sand is applied, a cost savings of approximately \$1700/ km/ year for a typical road in NS.

The current cost to pave a local gravel road is \$300,000 / km. After the road is paved, typically there is little to no maintenance performed on the road. The road gradually deteriorates and by year 25, it is cracked, rough and pot holed and beyond it's design and service life. At that point it would be required to be reconstructed and repaved at a cost of \$350,000. This is the situation for many of our paved local roads. Alternately, a paved road properly maintained over a twenty five year life cycle would cost \$338,000.

The life cycle costs for a double chip seal road is even lower. The 25 year cost to maintain a double chip seal road in very good to excellent condition by a contracted Chip seal crew is approximately \$255,000, which is a savings of about 25% over paving. The road is continuously maintained so residents see an improved level of service with the double chip sealed road

No new funds are required, funding for the program will come from the existing TIR capital (TCA) budget. Savings would begin to flow the year the program was instituted at a rate of approximately \$2.9 million (TCA) annually - the capital outlay will be recovered in less than 1 season of chip sealing.

25 yr Life Cycle Cost (Double Chip Seal versus Asphalt)

Chip Seal Activity		Price	Paving Activity		Price
Initial treatment TCA cost	Strengthen with gravel & double chip	\$226,500	Gravel and pave road		\$350,000
TCA saving		\$123,500			
3	Single Chip	\$24,500			
5			Single Chip seal (currently carried out on 50% of roads due to funding limitations)		\$12,250
11	Asphalt patching and single chip seal	\$27,000	Patching - \$900 / year for patching (yr 10 -24)		\$13,500
19	Asphalt patching and single chip seal	\$27,000			
1 - 25	Winter maintenance	\$42,500	Winter maintenance		\$85,000
25 yr operating cost/ km		\$121,000			\$110,750
Additional Amortization					121,000
Net 25 yr operating savings		\$110,750			

Note - Chip seal prices based on an average of NS and NB tendered prices as it is projected that an enlarged program would attract better pricing than current prices. Initial treatment is based on starting with an existing asphalt surface.

In summary the initial TCA treatment cost is 65% of the cost of asphalt (\$226,500 vs \$350,000). The annual operating costs are \$10,250 higher for the double chip, however there are amortization savings of \$121,000 leading to overall operational savings of \$110,750,

The Department has allocated \$12 - \$35 million per year in previous years for repaving local roads. At an average program of \$25 million, approximately one third or \$8.3 million would be allocated to double chip sealing eligible roads, and an annual savings of \$2.9 million (TCA) could be realized or an additional 12 kilometres could be rehabilitated (36 km rather than 24 if done with asphalt).

3. Anticipated service improvement/reduction:

Service improvements for the local low volume roads will be immediate. Roads pulverized and double chipped will have a significantly improved driving surface and lower vehicle operating costs. Gravel roads double chipped will also have an improved driving surface and dust will be eliminated. Winter service levels will be impacted to some degree on existing paved roads which are converted from salt to sand treatments, but gravel roads which are double chip sealed will see an improvement in winter service even though still sanded (the black surface attracts heat and cleans off the ice and snow faster).

4. Stakeholders/clients expected to be significantly affected:

The citizens of Nova Scotia will see an improved riding service on many low volume local roads which will be realized immediately.

5. Anticipated or projected major risks/implications:

The residents on paved low volume local roads which are significantly deteriorated are hoping for reconstruction and repaving of their road some day, hopefully sooner than later. There may be some concern about the loss of pavement and its replacement with chip seal. This will need to be offset initially through a strong communications strategy. Over time the increased maintenance via the reseals will on a long term basis provide a more consistent level of service and this concern should disappear. An objective decision matrix for selecting the proposed projects will be used and will be defensible as to why specific roads were chosen for double chip seal. Although there may be hesitation on the resident's part at first, the communication plan should address these concerns. The reality that we will probably be patching the road for the next 10 - 30 years before we can rehabilitate the road with the more traditional asphalt pavement will be a strong point to communicate. After a few years of the double chip seal program, residents will see the benefit of double chip roads.

6. Interconnections/implications with/for other projects, initiatives, Departments or stakeholders/clients.

The local road surface stabilization is intended to be a new component of the Government's 5 Year Paving Plan.

7. Any stakeholder/client or public consultation and the associated findings:

No stakeholder or public consultation has taken place.

8. Other issues which should be considered?

None

Pavement Preservation

1. Opportunity / Issue:

TIR also proposes to increase resurfacing of secondary roads using chip seal [redacted]

S. 13(1)
S. 14(1)
Advice

One of the most cost effective means of resurfacing and preserving our paved highways is to chip seal the surface. Chip sealing is a common pavement preventative maintenance practice that extends pavement life, provides a good driving surface, and reduces overall life cycle costs. Chip seal is about 40% of the cost of a conventional single asphalt overlay.

2. Scope of Opportunity

The pavement preservation program will include all paved roads in Nova Scotia which are in fair to good condition, excluding the 100 series. Prioritization for the pavement preservation program will be determined primarily through a pavement preservation list compiled and prioritized provincially and in consultation with local TIR staff. Preparation work such as crack sealing and/or asphalt patching, if required, would be sourced through the private sector.

3. Project Objectives:

The increased funding levels over the past few years for highway repaving has provided the citizens of Nova Scotia with an increase in the number of repaved kilometres but it still falls short of the funding required to maintain the paved road network at level of service acceptable to the travelling public. TIR requires a preventative maintenance program that preserves the infrastructure investment made in our highways and extends the life of the asphalt surface. Chip sealing paved roads when required will preserve the life of the road and reduce long term maintenance and rehabilitation costs.

Pavement preservation is a strategic investment. Placing a chip seal sooner than an asphalt overlay would be placed, the travelling public benefits from roads maintained in better condition. Chip seal provides a quick, reliable and economical surface treatment that will seal out the damaging effect of water, help to increase skid resistance, improve aesthetics and provide a new wearing surface to protect the pavement for years to come. By extending the time between asphalt overlays, chip seals result in lower costs over the long term. A chip seal is a perfect tool for pavement preventive maintenance.

Background:

Pavement preservation is the process of utilizing preventative treatments at early stages of deterioration in pavements to extend service life and defer more expensive repaving treatments. The Department currently maintains almost 14,000 km of paved roads, many of which do not meet service expectations due to their deteriorated conditions. Pavement preservation treatments typically return a 6:1 to 14:1 dollar payback as well as improve the serviceability of the road if done within the correct time frame. The Department has maintained a surface treatment program, however, reduced budgets and a focus on "worst first" project selection, for public acceptability reasons, have resulted in the program falling significantly behind. In recent years repaving work has averaged approximately 500 kilometres per year while the pavement preservation program has been about half of that size. This means that rehabilitated roads are not getting surface treatments and some of the repaving gains are being lost.

Analysis and Discussion:

1. Financial Benefits:

Chip sealing roads is a method of pavement preservation. It is well known in the industry that asphalt must be preserved to ensure a long life and avoid the huge costs associated with major rehabilitation or reconstruction, a situation we are currently in with our infrastructure. TIR's investment in the pavement infrastructure must be protected. The current investment of \$5M per year for pavement preservation is not sufficient. If TIR is repaving 2 km and surface treating only 1 that it is readily apparent that we are falling behind at a rate of 50% per year (quickly confirmed by taking a drive on rural secondary roads).

The chip sealing of paved roads has a long term payback period. It is a strategic investment to protect our paved infrastructure. Figures 1 clearly display that the rate of deterioration is fairly slow in the early years of the pavement's life. After the pavement reaches 75% of it's design life, the rate of deterioration accelerates rapidly. For every dollar spent before the 75% design life saves \$6 to \$14 dollars for the other 25% of the design life.

PAVEMENT PRESERVATION IS COST EFFECTIVE

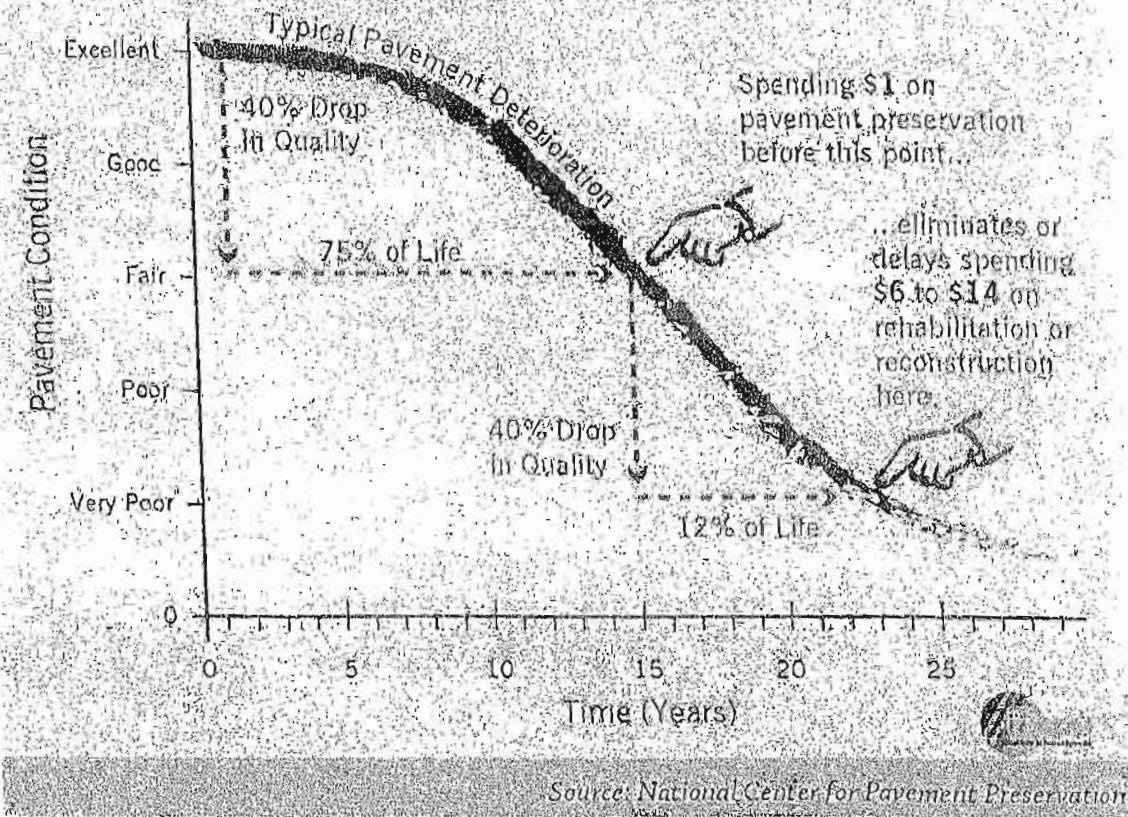


Figure 1

TIR will need to increase its resources budgeted for pavement preservation as part of ensuring a critical mass of work for the departmental crew while retaining the existing private sector activity in this area. This will allow public/private competition in this activity which has provided the Department with benefits in other areas such as centerline painting. An increase in this area is also needed to allow Government to meet its commitment of a 50% increase in pavement preservation activities.

§ 13(1)
§ 14(1)
Advice
Focus on
retention
therefore
not
back your
information

3. Anticipated service improvement/reduction:

As a long term strategy for pavement preservation (chip seal of paved roads), there will be an immediate service improvement when the chip seal is applied and a long term improvement over 10 to 20 years when preventative maintenance's efforts are realized in the reduction of major rehabilitations required. Chip sealed roads provides for more sustainable roads due to reduced service costs and an increase in the road quality.

4. Stakeholders/clients expected to be significantly affected:

The citizens of Nova Scotia will see smoother driving surfaces, and improved pavement management thus reduced costs in the long term.

5. Anticipated or projected major risks/implications:

None

6. Interconnections/implications with/for other projects, initiatives, Departments or stakeholders/clients.

Government committed to increase the pavement preservation budget by 50%.

7. Any stakeholder/client or public consultation and the associated findings:

No stakeholder or public consultation has taken place.

8. Other issues which should be considered?

None

TIR Provincial Chip Seal Crew

1. Opportunity / Issue:

In order to help most effectively achieve the first two components of this proposal, TIR proposes to establish a department chip seal operation. The department chip seal operation will allow us to provide local roads with a suitable travelling surface at a cost substantially less than asphalt paving and enhance pavement preservation of secondary roads.

TIR currently budgets \$5 M per year for pavement preservation. This work is tendered to the private sector and there are 2 companies which typically bid on the work.

TIR proposes to reallocate \$8 M per year from Maintenance Improvements (\$5.8M) and Local Road Repaving(\$2.2M) budgets for a total chip seal program of \$13 M per year. The existing budget of \$5 M per year for pavement preservation would be maintained and tendered to the private sector. The increase in funding (\$8 M /year) would be allocated to the department's chip seal operation to introduce a road stabilization program using double chip seal instead of asphalt pavement and increase the pavement preservation (resurfacing) of secondary roads.

2. Scope of Opportunity:

The establishment of a TIR chip seal operation and the reallocation of funding will allow TIR to introduce a cost effective road stabilization program using surface treatments such as double chip seal instead of asphalt pavement for low volume local paved roads. The operation will also allow TIR to increase the resurfacing of secondary roads, therefore, increasing the life of the asphalt and reducing the overall cost of pavement maintenance.

The chip seal operation will function under the provincial field crew model. The core staff and specialized equipment will travel across the province.

S. 14 (1)
Adverse
- premature
disclosure

The single chip seal and double chip seal operation is performed using the same equipment. Some of the equipment is specialized for chip seal but most of the equipment is generic construction equipment which can be utilized for other operations. TIR currently owns some of the equipment required and utilization of this equipment will be increased by a chip sealing operation. Some of the equipment which must be purchased for the chip seal operation could be used by the Department in the off season of the chip seal operation.

S. 17(1)(b)
(c) (d)
- Financial
- Personal
- premature
disclosure

The scope of work for road stabilization and pavement preservation includes the trucking and application of the chips, emulsion, fog seal and sand and the daily QA/QC for the operation. The materials required (emulsion, chips, sand) would be sourced through tenders or standing offers. The 80/20 rule where the local truckers are guaranteed 80% of the trucking for capital highway projects, would not apply in this case, similar to other work carried out by the department with in-house forces.

3. Project Objectives:

Financial analysis undertaken by the Department indicates that TIR can do the double chip seal work for 44% of the current tendered price and resurfacing of paved roads with chip seal for 57% of the current tender price. This is a significant savings and will allow TIR to do more work for the funding available. In addition the Department can expect benefits to staff by providing more continuous year round employment as a number of winter only staff will now be able to work in the summer season as well. Department equipment utilization can be expected to increase as well, currently the number of snowplows required in the winter season exceeds the amount of summer work available for these type of units (primarily tandem axle trucks), the Departmental Chip Seal Crew will need to utilize 8 -10 of these units helping to offset existing fixed costs.

Background:

The Department originally had a chip seal crew but it was disbanded in 1992 due to government's policy at that time. The crew travelled the province chip sealing paved roads during the summer months and the result was preservation of our paved roadways. After 1992, the shift was made to tendering the work to the private sector.

TIR has allotted an average of \$5.3 M per year for the last 10 years for pavement preservation. The work is tendered to the private sector and 1 - 2 bids are usually received. The price averages \$32,500/km for single chip seal and \$91,000/km for double chip seal.

The Nova Scotia Road Builders Association (NSRBA) members are the contractors for the existing pavement preservation program. The Truckers Association of Nova Scotia (TANS) provides the trucking services for this contracted work. The tendered chip seal work falls under the TIR 80-20 rule, 80% of the trucks are hired from the local TANS group and the contractor can supply the other 20% of the trucks.

Although Nova Scotia does not currently operate it's own chip seal crew, New Brunswick in comparison runs 3 chip seal crews and average \$16,100/km for single chip seal work and \$33,800/km for double chip seal. New Brunswick does contract out some of the chip seal program due to the limited capacity of their crews and the contract price is approximately 10% higher than their in-house price.

	Single Chip Seal (\$/km)	Double Chip Seal (\$/km)
Nova Scotia tendered	\$32,500	\$91,000
New Brunswick tendered	\$16,600	\$37,200
New Brunswick in-house	\$16,100	\$33,800

Table 1 - Comparison of Chip Seal Prices

Analysis and Discussion:**1. Financial Benefits:**

Based on the following costs and assumptions (see appendix "A" for the detailed breakdown), an analysis was performed for the optimum funding required to operate a chip seal crew for the available season, based on an approximate 70/30 spending split between single and double chip seal. The optimum funding required is approximately \$8,000,000 (see appendix "B" for details). Higher funding is not feasible as it would result in the crew working in less than optimum weather conditions, increasing the probability of failures due to lower temperatures and/or increased moisture. Lower funding would not allow the crew to operate for the entire season and therefore increase unit prices.

Based on the \$8 M funding, Nova Scolia can perform the single chip seal at 57% of the current tendered price and the double chip seal at 44% of the current tendered price

TIR Chip Seal Operation
Summary Financial Analysis
See Appendix "A" for Detailed Calculations

TCA funds \$2,575,000 (to come from existing TIR TCA budget)

Expenses:

Salaries & Benefits	\$532,100
Other	\$87,800* (accommodation and meals)
Amortization	<u>\$522,500</u>
Fixed Costs	\$1,142,400

Material Cost:

Single Chip	\$18,600 /km	or	\$2.66/ m ²
Double Chip	\$40,100 /km	or	\$5.73/ m ²

Equipment Cost: \$1,375 / hour (based on current amortization rates and assumptions noted below)

Assumptions

Season available for chip sealing - 12 weeks.

Percent down time for weather - 20%

Actual days available for chip sealing - 48 days @ 10 hrs/day

Single chip seal production rate - 10 km / day

Double chip seal production rate - 4 km / day

Table 2 - Comparison of Chip Seal Prices

	Single Chip Treatment/km	Double Chip Treatment/km
Nova Scotia tendered	\$32,500	\$91,000
Nova Scotia in- house	\$18,600	\$40,100
New Brunswick tendered	\$16,600	\$37,200
New Brunswick in-house	\$15,100	\$33,800

Note: some of the differences in the high cost of tendered work between NS and NB can be explained by NS's requirement that contractors follow the 80/20 rule, differences in the specifications for aggregate and emulsion as well as the NB practice of tendering all work in a geographic area, while NS tenders a number of projects scattered throughout the province. A large increase in the chip seal program plus the establishment of a Departmental chip seal crew will allow NS to better emulate the NB practices and we can expect a decrease in the cost for contracted work in NS, however, it is difficult to estimate the amount of decreases with any degree of accuracy.

At the expected program levels of approximately 70% of the funding being used for single chip seal pavement preservation and 30% being used for the local road stabilization plan annual savings for the chip seal portion of the work would be:

Single seals: \$ 5.8 million x (NS in-house/ NS tendered)
 \$ 5.8 m x ((*24,500-18,600)/24,500))
 \$ 1.4 m cost reduction

Double Seals: \$ 2.2 million x (NS in-house/ NS tendered)
 \$ 2.2 m x ((*64100-40,100)/64100)
 \$ 0.823 m cost reduction

*Average NS/NB tender prices used

Difference in Total Road Stabilization Costs (inhouse vs. tendered)

Year	Activity	Tendered Cost (\$/km)	Chip Seal Crew Cost (\$/km)	Savings
1	Strengthen With Gravel & Double Chip	\$176,500	\$150,000	\$26,500
3	Single Chip	\$24,500	\$18,600	\$5,900
11	Asphalt patching and single chip seal	\$27,000	\$21,100	\$5,900
19	Asphalt patching and single chip seal	\$27,000	\$21,100	\$5,900
25 yr life cost/km		\$255,000	\$210,800	\$44,200 17.3% less for TIR to do the work.

The chip seal portion of the work produces the savings as gravelling, ditching and other costs have been assumed to be equivalent as the intention is to continue to tender this part of the work, however, overall savings on a program basis are 17.3%.

Anticipated FTE implications: See appendix "A" for details.

NSGEU - 3 FTE's required.

S 14

S 14

Advice presented to minister by public body - no decision made yet.

employees with specialized training would be part of the core crew and travel across the province for the duration of the chip seal season. The other

S. 13, S. 14
S. 17(f)(c)(d)(e)

Decision not made at this point - still in deliberations.

4. Stakeholders/clients expected to be significantly affected:

Status quo is intended for the existing \$5M pavement preservation program - the existing budget of \$5 M per year for pavement preservation would be maintained and tendered to the private sector. The \$2.6 M required to purchase the equipment for the chip seal operation would come from the existing TCA 2010/11 budget. This would result in a minor adjustment to the capital program and the amount of work available to the Nova Scotia Road Builders Association.

The \$8 M funding to operate the chip seal program annually would be reallocated from the current capital and operating budgets. This figure represents a small percentage of the overall budget but would nonetheless be a reduction in the amount of work available to the local road building industry.

It is reasonable to expect push back from the local industry in this respect.

However, approximately \$6.5 M of the \$8 M for the chip seal operation each year will continue to come from the local industry. The \$6.5 M represents the cost of the chips, emulsion, fog seal and the sand which will continue to be purchased from private sector suppliers. So in essence, only \$1.5 M of the \$8 M taken from the capital budget will be a reduction in the amount of work available to the local road building industry.

5. Anticipated or projected major risks/implications:

The Trucking Association of Nova Scotia (TANS) will not support the proposal as TIR will perform all the trucking (work done by Department forces is not subject to the "80/20" rule which requires that 80% of the trucks on a contractors project come from the local area and be paid at the Department set rate). TANS will see this as work being taken away from them.

The Nova Scotia Road Builders Association (NSRBA) will not support the proposal. They will see this as the government infringing on their work.

6. Interconnections/implications with/for other projects, initiatives, Departments or stakeholders/clients.

TIR is also putting forward a proposal to purchase and operate a paving plant. Both the paving operation and chip seal operation are strategic investments in the Nova Scotia's infrastructure. This would result in an additional \$ 10 million of work being taken from the local road building industry, the combination of the two initiatives would result in a nominal \$18 million of work being reallocated from the local industry to TIR crews. Similar to the materials component of the chip seal operation noted above, most of the \$10 million required for the paving plant will still end up running through the local road building industry (aggregate crushing and asphalt liquid) so the net loss is perhaps only a third (ie \$6 m).

S 14
S. 7(1)(b)(c)(d)
- Finance
- Administration
- Procurement disclosure
Budget projections
still under
consideration

The paving and chip seal operation will allow TIR to experiment with different mixes, application rates, etc to determine the optimum criteria for Nova Scotia roads. Tendered contracts are specification driven and do not permit us try small scale test areas for new mixes or technologies.

7. Any stakeholder/client or public consultation and the associated findings:

No stakeholder or public consultation has taken place.

8. Other issues which should be considered?

TIR is currently in negotiation with the Highway Workers CUPE Local 1867

S: 14 Advice
S: 17(a) (b) (c) (e)
- Financial
- related to management of resources
- Negotiations

9. Risk Assessment: (Status quo versus proposals)

Risk Event	Probability	Magnitude of Impact	Risk Response
Status Quo			
Contract prices escalate	Medium	High	Chip sealing kilometres will decrease as cost / kilometre increases.
TIR does not have a true cost of the chip seal work.	High	High	There are only 2 bidders for chip sealing. The 2 contractors which bid the work control the market. Prices continue to increase.
TIR does not have the flexibility to try various chip seal mixes.	High	Low	TIR must rely on other government agencies who operate chip seal crews to test various mixes for service life and costs.
Proposal Risks			
Nova Scotia Road Builders will lobby government not to purchase chip seal operation.	High	Medium	Financial analysis shows that TIR can chip seal roads cheaper than tendering the work. New Brunswick's chip sealing operations further supports this fact.
TANS will lobby government for the trucking work	High	Medium	Promote the higher utilization of government equipment and the increase in the number of employees.

associated with the chip seal operation.			
Lack of in-house skills for chip seal operation.	High	Medium	There are a few people currently on staff who were involved in the previous TIR chip seal crew but they are reaching retirement age. These people can be used to mentor new staff and if they retire, hired on a part time basis until the new crew is fully operational.
Inability to recruit and maintain specialized workers.	Medium	High	Promote the benefits of working for government versus the private sector. Offer the option of seasonal or year around work to attract the right individuals.
Availability of future funding	Medium	Low	Government has committed to increase resurfacing for secondary roads by 50%. <div style="border: 1px solid black; width: 150px; height: 20px; margin: 5px 0;"></div> The chip seal program will assist government in meeting this commitment.
Ability to convince key stakeholders of the benefits of pavement management / pavement preservation.	Medium	Medium	Use the example of New Brunswick and other areas in Canada that have implemented pavement management and the positive impacts the program.
Residents on roads to be pulverized and/ or double chip will be hesitant of the proposed work.	High	Medium	Have a set of criteria established for selection of projects. Communicate to residents the alternative to the double chip - asphalt patching for an indefinite period of time.

S 14
S 17 (b) (b)
(c) (d)

10. Recommendations:

- a. Government should institute a policy shift to use double chip seal stabilization instead of asphalt pavement for low volume local roads. This should produce program savings of approximately \$2.9 million per year of TCA funding.
- b. Government should increase efforts in pavement preservation through the increased use of single chip seals on secondary paved roads. This will enhance the life span and service levels of roads as they are repaved and reduce life cycle costs, deferring TCA expenditures and thereby allowing an increase in the service levels for the same level of investment.
- c. To best facilitate the first two recommendations and achieve the most value and cost savings, Government should establish a Departmental chip seal crew operation. This operation, based on expected pricing in the market, will produce efficiencies of approximately \$1.4million (Operational) and 0.82 million (TCA) per year.

11. Recommended Implementation:

A communications plan would be developed to advise the public and key stakeholders. This will have to be coordinated with communications plan for 5 year highway capital construction/paving plan.

The crew would be set up under the same model TIR has for provincial field crews with a few modifications. The chip seal crew is large enough to justify self sufficiency in technical expertise, supervision and clerical support.

A steering committee would be assembled with representatives from Construction Services, Miller Lake Mechanical Branch and senior management. The steering committee would develop the project charter, oversee the implementation and roll out of the program. The steering committee would be responsible procure the equipment required and staff the crew. The recruitment for the supervisor would also begin in the summer of 2010. The equipment would be specified and tendered in the fall on 2010. During the winter of 2011, the remaining core personal would be recruited.

Simultaneously, a program for the chip seal operation would be developed and tenders or standing offers for chips, emulsion, and sand would be issued.

New Brunswick currently operates 3 in-house chip seal crews and they have offered to assist us in any way that they can. We would be in conversation with them for recommendations on type of equipment and to assist in the training of our crew.

The steering committee developed from department personal would be responsible to procure the equipment required and staff the crew. Once core staff is in place, the superintendent would be responsible for the overall operation of the crew.

Hiring of superintendent would occur in the summer of 2010. Equipment would be procured in the fall of 2010 and hiring of the other core staff winter of 2011. Standing offers for materials would be issued in the winter of 2011. Training would occur in the spring of 2011 and the operation would start in the summer of 2011.

Government representatives, union officials, NSRBA and TANS would have to be briefed on the program. A strong communication plan would have to be developed and New Brunswick's program could be used as an example of the benefits of a TIR operated chip seal program.

Appendix "A"

Chip Seal Equipment Required

Equipment	Quantity	Capital Cost	Hourly Rate Each	Hourly Rate Total
Distributor Trucks	2	\$500,000.00	\$65.00	\$130.00
Chip Spreader	1	\$250,000.00	\$73.00	\$73.00
Roller	2	\$250,000.00	\$40.00	\$80.00
Loader	1	\$250,000.00	\$76.75	\$76.75
Broom	1	\$100,000.00	\$25.00	\$25.00
Tandems (Use AM's)	8	\$0.00	\$70.00	\$560.00
Grader	1	\$0.00	\$69.00	\$69.00
Floats (tractor/trailer)	3	\$750,000.00	\$65.00	\$195.00
Signing 3/4 tonne	1	\$50,000.00	\$22.00	\$22.00
2 - 1/2 tonnes	2	\$50,000.00	\$17.00	\$34.00
Portable Emulsion Storage	1	\$250,000.00	\$74.00	\$74.00
Office trailer	1	\$125,000.00	\$37.00	\$37.00
Total Capital		\$2,575,000.00		\$1,375.75

Chip Seal Crew Employees

Position	Number	Hr Rate Each	Cost / Year
Civil Tech (QA/QC)		\$24.48	\$50,000
Superintendent		\$28.36	\$57,800
Secretary / Eng Aide		\$21.73	\$44,300
Spreader - 2 operators		\$18.48	\$19,961
Distributor(2) - 2 operators		\$17.98	\$19,421
Rollers (2) - 2 operators		\$18.48	\$19,961
Loader		\$18.48	\$9,980
Broom - 1 operator		\$18.48	\$9,980
Tandems		\$18.48	\$79,844
Trailers(3) - 3 operators		\$18.48	\$29,941
3 operators/crewmen		\$17.85	\$28,917
1 op/cr walking behind distributor		\$18.48	\$9,980
Subtotal	26		\$380,087
40% Benefits			\$152,035
Total Salaries			\$532,121.99

(a) (b) (c) (e)
 Financial management
 Personnel management
 Equipment maintenance

Material Costs

Single Chip	Application Rates	Per Km @ 7 m wide	Price / Unit	Cost per KM Materials
Emulsion (L/m ²)	2.24	15,680	\$0.74	\$11,603.20
Chips (kg/m ²)	13	91	\$10.00	\$910.00
Fog Seal (L/m ²)	0.5	3,500	\$0.74	\$2,590.00
Sand (kg/m ²)	2.5	18	\$5.00	\$87.50
				\$15,190.70
Double Chip				
Emulsion - 1st (L/m ²)	2.4	16,800	\$0.74	\$12,432.00
Chips - 1st (kg/m ²)	15	105	\$10.00	\$1,050.00
Emulsion - 2nd (L/m ²)	3	21,000	\$0.74	\$15,540.00
Chips - 2nd (kg/m ²)	13	91	\$10.00	\$910.00
Fog Seal (L/m ²)	0.5	3,500	\$0.74	\$2,590.00
Sand (kg/m ²)	2.5	18	\$5.00	\$87.50
				\$32,609.50

Appendix B

Appendix B Cost Analysis TIR Operation	Budget Available Scenarios		
	\$4,000,000	\$6,000,000	\$8,000,000
Target KM	147	257	366
Target KM - SC	125	218	311
Target KM - DC	22	39	55
Target m2 - SC	876,029	1,527,550	2,179,270
Target m2 - DC	154,593	269,585	384,577
KM/day - SC	10	10	10
KM/Day - DC	4	4	4
Days Work - SC	13	22	31
Days Work - DC	6	10	14
Rain/down Days	42	29	15
Total Days	60	60	60
Rates For TIR Crew	Cost Develop	Cost Develop	Cost Develop
Equipment (/hr) SC	172,171	300,238	428,304
DC	75,958	132,458	188,958
Labour (/hr) SC	66,574	116,095	165,615
DC	29,374	51,218	73,066
Labour (FY - Fixed) SC	180,999	180,999	180,999
DC	31,941	31,941	31,941
Materials (m2) - SC	1,901,072	3,315,152	4,729,233
Materials (/m2) - DC	720,174	1,255,863	1,791,552
Lodging (& HC/day) SC	18,322	31,950	45,578
DC	8,083	14,095	20,108
Overtime - SC	42,087	50,506	58,924
Overtime - DC	10,423	14,137	17,851
Downtime (Eq/Lr) SC	515,430	350,650	185,869
DC	227,396	154,698	82,001
Total SC	2,896,655	4,345,589	5,794,523
Cost / m2	3.31	2.84	2.66
Total DC	1,103,345	1,654,411	2,205,477
Cost/m2	7.14	6.14	5.73
Total Cost	4,000,000	6,000,000	8,000,000
weighted Cost/m2	3.88	3.34	3.12

- A \$10 million dollar scenario was not possible under this assessment as the length of the Nova Scotia Construction season precludes having any additional construction days available to increase the program size.

