1 BALDWIN STREET,
MONTPELIER, VT 05633-5701

PHONE: (802) 828-2295
FAX: (802) 828-2483

STATE OF VERMONT
JOINT FISCAL OFFICE

MEMORANDUM

To: James Reardon, Commissioner of Finance & Management

From: Nathan Lavery, Fiscal Analyst

Date: September 23, 2009

Subject: JFO #2392, #2393, #2394

No Joint Fiscal Committee member has requested that any of the following items be held for review:

JFO #2392 — $13,070 worth of materials and labor from Ennis Paint, Inc. to the Agency of Transportation. Ennis Paint will supply materials and installation of a road surface treatment designed to reduce winter accidents. The product will be evaluated by the State for effectiveness. The State is under no obligation to purchase or endorse this product.
[*JFO received 8/24/09*]

JFO #2393 — $22,500 grant from United States Department of Agriculture (USDA) Rural Development to Agriculture, Food and Markets. This grant will be used to develop a business plan and facilitate additional research into the development of a natural ice cider industry in Vermont.
[*JFO received 8/24/09*]

JFO #2394 — $40,000 grant from United States Department of Agriculture (USDA) Rural Development to Agriculture, Food and Markets. These grant funds will be used to conduct a feasibility study on place-based marketing related to Vermont artisan cheese.
[*JFO received 8/24/09*]

In accordance with 32 V.S.A. §5, the requisite 30 days having elapsed since these items were submitted to the Joint Fiscal Committee, the Governor's approval may now be considered final. We ask that you inform the Secretary of Administration and your staff of this action.

cc: David Dill, Secretary
Roger Allbee, Secretary

1 BALDWIN STREET,
MONTPELIER, VT 05633-5701

PHONE: (802) 828-2295
FAX: (802) 828-2483

STATE OF VERMONT
JOINT FISCAL OFFICE

MEMORANDUM

To: Joint Fiscal Committee Members

From: Nathan Lavery, Fiscal Analyst

Date: August 31, 2009

Subject: Grant Requests

Enclosed please find four (4) requests that the Joint Fiscal Office has received from the administration:

JFO #2392 — $13,070 worth of materials and labor from Ennis Paint, Inc. to the Agency of Transportation. Ennis Paint will supply materials and installation of a road surface treatment designed to reduce winter accidents. The product will be evaluated by the State for effectiveness. The State is under no obligation to purchase or endorse this product.
[*JFO received 8/24/09*]

JFO #2393 — $22,500 grant from United States Department of Agriculture (USDA) Rural Development to Agriculture, Food and Markets. This grant will be used to develop a business plan and facilitate additional research into the development of a natural ice cider industry in Vermont.
[*JFO received 8/24/09*]

JFO #2394 — $40,000 grant from United States Department of Agriculture (USDA) Rural Development to Agriculture, Food and Markets. These grant funds will be used to conduct a feasibility study on place-based marketing related to Vermont artisan cheese.
[*JFO received 8/24/09*]

JFO #2395 — $17,500 grant from the Federal Emergency Management Agency to the Department of Public Safety. These grant funds will be used to purchase two underwater camera systems as part of an effort to monitor Vermont's waterways.
[*JFO received 8/31/09*]

The Joint Fiscal Office has reviewed these submissions and determined that all appropriate forms bearing the necessary approvals are in order. In accordance with the procedures for processing such requests, we ask you to review the enclosed and notify the Joint Fiscal Office (Nathan Lavery at (802) 828-1488; nlavery@leg.state.vt.us) if you have questions or would like an item held for Joint Fiscal Committee review. Unless we hear from you to the contrary by September 16 we will assume that you agree to consider as final the Governor's acceptance of these requests.

cc: James Reardon, Commissioner
David Dill, Secretary
Roger Allbee, Secretary
Thomas Tremblay, Commissioner

JFO # 2392

VERMONT

State of Vermont
Department of Finance & Management
109 State Street, Pavilion Building
Montpelier, VT 05620-0401

[phone] 802-828-2376
[fax] 802-828-2428

Agency of Administration

STATE OF VERMONT
FINANCE & MANAGEMENT GRANT REVIEW FORM

Grant Summary:	The Ennis Paint Company will supply materials and installation of a road surface treatment intended to reduce winter accidents.				
Date:	8/10/2009				
Department:	AOT Program Development Materials and Research Section				
Legal Title of Grant:	Pavement Surface Treatment Donation				
Federal Catalog #:	N/A				
Grant/Donor Name and Address:	Ennis Paint, Inc. 1509 S. Kaufman, Ennis, TX 75119				
Grant Period: From:	9/1/2009	**To:**	9/1/2009		
Grant/Donation	$13,070 value of materials and installation				

	SFY 1	SFY 2	SFY 3	Total	Comments
Grant Amount:	$13,070	$	$	$	

	# Positions	Explanation/Comments
Position Information:	0	

Additional Comments:	See attached.	

Department of Finance & Management	[signature]	(Initial)
Secretary of Administration	[signature] 8/11/09	(Initial)
Sent To Joint Fiscal Office	8/18/09	**Date**

RECEIVED
AUG 24 2009
JOINT FISCAL OFFICE

STATE OF VERMONT REQUEST FOR GRANT ACCEPTANCE (Form AA-1)

BASIC GRANT INFORMATION	
1. Agency:	Vermont Agency of Transportation
2. Department:	Program Development
3. Program:	Materials and Research Section - Research and Development Unit
4. Legal Title of Grant:	None
5. Federal Catalog #:	None

6. Grant/Donor Name and Address:
Ennis Paint, Inc., 1509 S. Kaufman, Ennis, TX 75119

7. Grant Period:	**From:**	9/1/2009	**To:**	9/1/2009

8. Purpose of Grant:
The Ennis Paint Company will supply materials and installation of a product marketed for increased safety. The installation will be used to evaluate the performance of a proprietary feature intended to reduce or eliminate vehicular accidents by increasing friction on the road's surface (please see attached work plan).

9. Impact on existing program if grant is not Accepted:
Will not have the ability to perform a product assessment to determine if a new pavement surface treatment intended to increase surface friction is durable with respect to Vermont's winter climate and reduces accidents due to downward braking on wet and slippery roads.

10. BUDGET INFORMATION

	SFY 1	SFY 2	SFY 3	Comments
Expenditures:	FY 2009	FY	FY	
Personal Services	$	$	$	
Operating Expenses	$	$	$	
Grants	$	$	$	
Total	$	$	$	
Revenues:				
State Funds:	$	$	$	
Cash	$	$	$	
In-Kind	$	$	$	
Federal Funds:	$	$	$	
(Direct Costs)	$	$	$	
(Statewide Indirect)	$	$	$	
(Departmental Indirect)	$	$	$	
Other Funds:	$	$	$	
Grant (source Ennis Paint)	$13,070	$	$	
Total	$13,070	$	$	

Appropriation No:		**Amount:**	$
			$
			$
			$
			$

STATE OF VERMONT REQUEST FOR GRANT ACCEPTANCE (Form AA-1)

			$
			$
		Total	$

PERSONAL SERVICE INFORMATION

11. Will monies from this grant be used to fund one or more Personal Service Contracts? ☐ Yes ☒ No
If "Yes", appointing authority must initial here to indicate intent to follow current competitive bidding process/policy.

Appointing Authority Name: Agreed by: _____ (initial)

12. Limited Service Position Information:	**# Positions**	**Title**
Total Positions		

12a. Equipment and space for these positions: ☐ Is presently available. ☐ Can be obtained with available funds.

13. AUTHORIZATION AGENCY/DEPARTMENT

I/we certify that no funds beyond basic application preparation and filing costs have been expended or committed in anticipation of Joint Fiscal Committee approval of this grant, unless previous notification was made on Form AA-1PN (if applicable):

Signature: Richard Edwards Date: 7/22/09
Title: VTRANS DIRECTOR OF PROGRAM DEVELOPMENT

Signature: David C Dill Date: 7/23/09
Title: SECRETARY OF TRANSPORTATION

14. ACTION BY GOVERNOR

☑ Check One Box: Accepted
☐ Rejected

(Governor's signature) Date: 8/15/09

15. SECRETARY OF ADMINISTRATION

☑ Check One Box: Request to JFO
☐ Information to JFO

(Secretary's signature or designee) Date: 8/11/09

16. DOCUMENTATION REQUIRED

Required GRANT Documentation

☐ Request Memo
☐ Dept. project approval (if applicable)
☐ Notice of Award
☐ Grant Agreement
☐ Grant Budget
☐ Notice of Donation (if any)
☐ Grant (Project) Timeline (if applicable)
☐ Request for Extension (if applicable)
☐ Form AA-1PN attached (if applicable)

End Form AA-1

REC'D JUL 30 2009

From: Richard Baker [rbaker@ennispaint.com]
Sent: Monday, July 13, 2009 7:51 PM
To: Fitch, Jennifer; Kipp, Wendy
Cc: Steve Gainer
Subject: VT DOT Tyregrip trial

Jennifer, Wendy

Please take this email as acceptance of the terms of the Tyregrip trial installation for the Vermont Department of Transportation as follows:

Ennis Paint, Inc

Will supply all labor, equipment, materials and supervisory staff to install a test section of the Tyregrip system for the State of Vermont at the designated location at no cost to the state, the state will provide traffic control at the trial location at no cost to Ennis Paint, Inc.

Ennis Paint, Inc will not request or except any endorsement or promotion of the installation of the Tyregrip system by the state, we do however understand that an evaluation of the installation will be conducted by the state materials office in the future to determine the performance of the installed Tyregrip system.

Many thanks for allowing Ennis Paint, Inc to install the Tyregrip system.

Yours,

Richard J. Baker
On behalf of Ennis Paint, Inc

Richard J. Baker
Ennis Paint Company
Global Brand Manager
Prismo Surfacing Products
Office. 804 213 0335
Cell. 804 319 7456
Fax. 804 213 0337
rbaker@ennispaint.net

Vermont Agency of Transportation
Program Development Division
Materials and Research Section
Phone (802)828-2561 Fax (802)828-2792

To: Jason Aronowitz, Budget Analyst

From: William Ahearn, Materials and Research Engineer
Wendy Kipp, Research Technician via

Date: Tuesday, June 30th, 2009

Subject: Grant Approval for High Friction Surface Overlay

One of the Vermont Agency of Transportation's missions is to "make safety a critical component in the development, implementation and maintenance of the transportation systems…through reducing the number of annual major highway crashes." Given the topographic nature of the nature of state along with Vermont's harsh winter climate, this goal requires the implementation of new technologies intended to make our roadways safer through various means. The evaluation of new technologies is expressly authorized in the federal transportation programs through the use of an experimental feature – by definition an unproven technology or material that shows promise in addressing a transportation problem. These emerging technologies require long term surveillance to verify manufacturer's claims and ensure that the product poses no threats to the traveling public or increased maintenance costs to the tax payers of Vermont.

Ennis Paint of Ennis, Texas produces a new product known as Tyregrip, a patented pavement overlay intended to increase the friction of a roadway surface. They have offered to grant the State approximately 500 square yards for the express purpose of conducting a performance evaluation. In collaboration with the Agency's Highway Safety and Design Section, a high crash location has been nominated for the experimental application, an existing roadway surface within the west bound lane of VT Route 9 in the Town of Woodford at approximately (mile marker) MM 3.0. The roadway alignment is curved with a steep decline at a grade of 8%, only further compounding the problems associated with wet and slippery roads. This location was selected for this project due to a high rate of accidents reported by Highway Safety and Design personnel and local police enforcement. The VTrans' Crash Reporting System documented 13 injuries and 4 fatalities from mile marker MM 2.78 to MM 3.18 from 2000 to 2008 along this roadway segment.

The approximate value of the grant is $13,070 including material and labor. THERE ARE NO DIRECT PAYMENTS UNDER THIS GRANT. Installation will be performed in accordance with all Agency policies. **It is important to note that VTrans is under no current or future obligations to endorse or purchase this product.** The intent of this experimental application is solely to examine product performance over time with respect to accident reduction and durability.

Currently, there are no trial evaluations from any northeast state pertaining to this product. All surveillance and testing will be carried out in accordance with the attached work plan. If possible, the experimental roadway surface will be applied later this summer or early fall as there are minimum ambient application requirements. I respectfully request your approval of the grant.

Prepared By: Wendy Kipp
Date: 6-25-2009

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS AND RESEARCH SECTION

WORK PLAN FOR RESEARCH INVESTIGATION
Ennis Paint, Inc. Tyregrip High Friction Surface System
Work Plan No. WP 2009-2

OBJECTIVE OF STUDY:

The Vermont roadway network has an abundance of curves and steep inclines due to the varying topographic nature of the state. This coupled with many rural roads and inclement weather can create hazardous roadway conditions for all motorists. Injuries and fatalities along these dangerous locations are problematic not only in Vermont but nationwide. According to the, "Guide for Reducing Collisions on Horizontal Curves," 75 percent of all fatal crashes occur in rural areas and 25 percent are at curves. [FHWA] Many fatalities are from run-off-the road crashes involving single vehicles. In an effort to combat these disheartening statistics, the Federal Highway Administration (FHWA) developed various strategies for state transportation agencies to use as alternative countermeasures in an effort to decrease crashes. Basic strategies incorporate various pavement markings and other traffic control devices. However, in Vermont, due to winter maintenance practices, these basic treatments are often damaged during winter months and are not sufficient in many locations. Subsequently, innovative and experimental treatments are recommended, such as high friction surface overlays.

The purpose of this evaluation is to apply an experimental roadway treatment manufactured by Ennis Paint, Inc. known as Tyregrip, a high friction safety overlay. This system consists of a highly modified exothermic epoxy resin two-part binder that is top dressed with a calcinated bauxite aggregate. Crash data prior to and following installation, as well as skid testing, will be used to evaluate the effectiveness of the treatment with regards to both clear and inclement conditions.

LOCATION:

The experimental feature is to be applied to the existing roadway surface within the west bound lane of VT Route 9 in the Town of Woodford at approximately MM 3.0. The roadway alignment is curved with a steep decline at a grade of 8% as shown in Figure 1, only further compounding the problems associated with wet and slippery roads. The estimated longitudinal length of the application is approximately 266' with a roadway

width of 17', encompassing both the travel lane and shoulder, for a total area of approximately 4522 ft^2.

Figure 1 – Overview View of the Site

This location was selected for this project due to a high rate of accidents reported by Highway Safety and Design personnel and local police enforcement. The VTrans' Crash Reporting System documented 13 injuries and 4 fatalities from mile marker (MM) 2.78 to MM 3.18 from 2000 to 2008 along this roadway segment. In addition, according to Mike Marvin from the Shaftsbury State Police Station, numerous accidents and incidents have been documented all of which are not currently reported within the VTrans's Crash Reporting System. Mike Marvin reported an increase of accidents during the winter months due to the accumulation of ice and snow resulting in a loss of traction.

MATERIAL:

Tyregrip was developed in the United Kingdom (UK) by the Greater London Council (GLC) and is licensed and marketed by Ennis Paint, Inc. of Ennis, Texas. Tyregrip is a patented pavement overlay composed of a highly modified epoxy two part resin binder and surfaced with calcined bauxite, a reported extremely hard aggregate that retains sharp edges and facets over time. This mixture results in a minimum Polished Stone Value (PSV) of 70% for performance durability with high friction properties on wet or dry pavements.

INSTALLATION REQUIREMENTS:

In accordance with the manufacturers' instructions, the two-part modified base epoxy shall to a dry surface. The ambient surface temperature should be between 48°F and 110°F. All surfaces shall be cleaned by use of mechanical sweepers so that the surface is clean, dry, and free of all dust, oil, debris and any other material that might interfere with

the bond between the epoxy binder material and existing surfaces. Surfaces may need to be washed with a mild detergent, rinsed, and dried using a hot compressed air lance. All existing pavement markings shall be removed and all joints and cracks greater than ¼" filled before placement. The treatment can be applied by either hand mixing or mechanical mixing of the epoxy binder. Due to the physical nature of the site, the manufacturer suggests that the mechanical application be used. This method applies the epoxy by a truck mounted application machine onto the pavement section of widths up to 8 feet wide at a minimum coverage rate of 15 gallons per minute with a uniform thickness of 60 mils. Immediately following, the aggregate should be spread at a rate of 13 lbs +/- 2 lbs per square yard up to 8 foot widths. Compaction is not required. At an ambient temperature of 75°F, the curing time is approximately 2 hours. Any excess aggregate should be removed by hand or suction sweeping before the pavement section is reopened to traffic.

COST:

This research initiative is to be a joint effort between the VTrans' Highway Safety and Design Section and manufacturer, Ennis Paint, Inc. Ennis Paint, Inc. is to furnish all associated product relating to the patented system including the epoxy and calcined bauxite aggregate. The manufacturer will also be responsible for the installation of the experimental feature and all associated labor costs. The Highway Safety and Design section is to supply traffic control.

For future reference, Ennis Paint quoted an approximate material cost of $14.64 per square yard. For this application, at a length of 266' and width of 17' this approximate to an approximate area of 503 square yards. Therefore total material cost is approximately $7370. With respect to the cost of installation, Ennis Paint stated that a private contractor may charge somewhere in the vicinity of $26 per square yard for both the cost of materials and labor. Therefore for this application, labor would cost approximately $5700 for a total approximate project cost of $13,070.

It is important to note that VTrans is under no current or future obligations to endorse or purchase this product. The intent of this experimental application is solely to examine product performance over time with respect to accident reduction and durability.

SURVEILLANCE AND TESTING:

In an effort to reduce vehicular accidents due to roadway design, Research personnel will assess the roadway surface overlay in the following manner:

1. Research personnel will monitor and observe all installation activities. This may include any preparation activities as well as application efforts. The time for installation and return of traffic is to be recorded.
2. An annual collection of IRI (international roughness index) is to be collected through the Pavement Management Section.
3. All crash data from 2000 to the present day and throughout the study period is to be collected from the Traffic Research Section and local police records.
4. Visual inspections of the roadway surface, prior to and following application, are to be conducted annually to examine any potential product delamination following application.
5. Two 1' by 1' squares are to be delineated on the surface of the experimental substrate through the use of traffic paint following installation. One is to be identified within a wheel path and one is not to be located in a wheel path. Photographs are to be taken on an annual basis and compared to previous years to determine any loss of aggregate due to vehicle tires or wintertime maintenance activities.
6. Photographs of the overall site are to be collected on an annual basis and any other pertinent information is to be recorded.
7. If feasible, the Standard Method of Test for Frictional Properties of Paved Surfaces Using a Full-Scale Tire (AASHTO T 242-96) is to be performed at several intervals during the experiment. In correlation with this test, the Standard Method of Test for Surface Frictional Properties using the British Pendulum Tester (AASHTO T 278-90) will be utilized to test skid resistance. Five swings per test will be conducted and results averaged to produce a British Pendulum Number (BPN) that may be used to determine the relative effects of skid resistance materials. The BPN will be compared each year to monitor any loss in skid resistance over time.
8. Ennis Paint will be requested to supply a representative sample of the parent aggregate material for testing in accordance with ASTM C 131-06, "Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine." Mass lost through this test method will be compared to other aggregates throughout the state.

DURATION OF THE STUDY:

The duration of this study will be no more than three years or until final conclusions can be drawn from the observations and results from data collection.

REPORTS:

An initial report will be prepared to include the installation of the materials and preliminary observations, with a subsequent final report at the conclusion of the study. Interim reports will be prepared and submitted as needed. These reports will be authored by Research staff.

Agency of Transportation Reviewed By:
Materials and Research Section

William Ahearn P.E.
Materials and Research Engineer
Date: 7/7/2009

References:

Federal Highway Administration. "Low-Cost Treatments for Horizontal Curve Safety." December 2006.

JFO # 2392

VERMONT

State of Vermont
Department of Finance & Management
109 State Street, Pavilion Building
Montpelier, VT 05620-0401

[phone] 802-828-2376
[fax] 802-828-2428

Agency of Administration

STATE OF VERMONT
FINANCE & MANAGEMENT GRANT REVIEW FORM

Grant Summary:	The Ennis Paint Company will supply materials and installation of a road surface treatment intended to reduce winter accidents.				
Date:	8/10/2009				
Department:	AOT Program Development Materials and Research Section				
Legal Title of Grant:	Pavement Surface Treatment Donation				
Federal Catalog #:	N/A				
Grant/Donor Name and Address:	Ennis Paint, Inc. 1509 S. Kaufman, Ennis, TX 75119				
Grant Period: From:	9/1/2009	**To:**	9/1/2009		
Grant/Donation	$13,070 value of materials and installation				

	SFY 1	SFY 2	SFY 3	Total	Comments
Grant Amount:	$13,070	$	$	$	

	# Positions	Explanation/Comments
Position Information:	0	

Additional Comments:	See attached.	
Department of Finance & Management		(Initial)
Secretary of Administration	MFL 8/11/09	(Initial)
Sent To Joint Fiscal Office	8/18/09	**Date**

RECEIVED
AUG 24 2009
JOINT FISCAL OFFICE

STATE OF VERMONT REQUEST FOR GRANT ACCEPTANCE (Form AA-1)

BASIC GRANT INFORMATION	
1. Agency:	Vermont Agency of Transportation
2. Department:	Program Development
3. Program:	Materials and Research Section - Research and Development Unit
4. Legal Title of Grant:	None
5. Federal Catalog #:	None

6. Grant/Donor Name and Address:
Ennis Paint, Inc., 1509 S. Kaufman, Ennis, TX 75119

7. Grant Period:	**From:**	9/1/2009	**To:**	9/1/2009

8. Purpose of Grant:
The Ennis Paint Company will supply materials and installation of a product marketed for increased safety. The installation will be used to evaluate the performance of a proprietary feature intended to reduce or eliminate vehicular accidents by increasing friction on the road's surface (please see attached work plan).

9. Impact on existing program if grant is not Accepted:
Will not have the ability to perform a product assessment to determine if a new pavement surface treatment intended to increase surface friction is durable with respect to Vermont's winter climate and reduces accidents due to downward braking on wet and slippery roads.

10. BUDGET INFORMATION

	SFY 1	SFY 2	SFY 3	Comments
Expenditures:	FY 2009	FY	FY	
Personal Services	$	$	$	
Operating Expenses	$	$	$	
Grants	$	$	$	
Total	$	$	$	
Revenues:				
State Funds:	$	$	$	
Cash	$	$	$	
In-Kind	$	$	$	
Federal Funds:	$	$	$	
(Direct Costs)	$	$	$	
(Statewide Indirect)	$	$	$	
(Departmental Indirect)	$	$	$	
Other Funds:	$	$	$	
Grant (source Ennis Paint)	$13,070	$	$	
Total	$13,070	$	$	

Appropriation No:		**Amount:**	$
			$
			$
			$
			$

STATE OF VERMONT REQUEST FOR GRANT ACCEPTANCE (Form AA-1)

			$
			$
		Total	$

PERSONAL SERVICE INFORMATION

11. Will monies from this grant be used to fund one or more Personal Service Contracts? ☐ Yes ☒ No
If "Yes", appointing authority must initial here to indicate intent to follow current competitive bidding process/policy.

Appointing Authority Name: Agreed by: _____ (initial)

12. Limited Service Position Information:	**# Positions**	**Title**
Total Positions		

12a. Equipment and space for these positions: ☐ Is presently available. ☐ Can be obtained with available funds.

13. AUTHORIZATION AGENCY/DEPARTMENT

I/we certify that no funds beyond basic application preparation and filing costs have been expended or committed in anticipation of Joint Fiscal Committee approval of this grant, unless previous notification was made on Form AA-1PN (if applicable):

Signature: [signature] Date: 7/22/09
Title: VTRANS DIRECTOR OF PROGRAM DEVELOPMENT

Signature: [signature] Date: 7/23/09
Title: SECRETARY OF TRANSPORTATION

14. ACTION BY GOVERNOR

☑ Check One Box: Accepted
☐ Rejected

[signature] (Governor's signature) Date: 8/15/09

15. SECRETARY OF ADMINISTRATION

☑ Check One Box: Request to JFO
☐ Information to JFO

[signature] (Secretary's signature or designee) Date: 8/11/09

16. DOCUMENTATION REQUIRED

Required GRANT Documentation

- ☐ Request Memo
- ☐ Dept. project approval (if applicable)
- ☐ Notice of Award
- ☐ Grant Agreement
- ☐ Grant Budget
- ☐ Notice of Donation (if any)
- ☐ Grant (Project) Timeline (if applicable)
- ☐ Request for Extension (if applicable)
- ☐ Form AA-1PN attached (if applicable)

End Form AA-1

RECD JUL 30 2009

From: Richard Baker [rbaker@ennispaint.com]
Sent: Monday, July 13, 2009 7:51 PM
To: Fitch, Jennifer; Kipp, Wendy
Cc: Steve Gainer
Subject: VT DOT Tyregrip trial

Jennifer, Wendy

Please take this email as acceptance of the terms of the Tyregrip trial installation for the Vermont Department of Transportation as follows:

Ennis Paint, Inc

Will supply all labor, equipment, materials and supervisory staff to install a test section of the Tyregrip system for the State of Vermont at the designated location at no cost to the state, the state will provide traffic control at the trial location at no cost to Ennis Paint, Inc.

Ennis Paint, Inc will not request or except any endorsement or promotion of the installation of the Tyregrip system by the state, we do however understand that an evaluation of the installation will be conducted by the state materials office in the future to determine the performance of the installed Tyregrip system.

Many thanks for allowing Ennis Paint, Inc to install the Tyregrip system.

Yours,

Richard J. Baker
On behalf of Ennis Paint, Inc

Richard J. Baker
Ennis Paint Company
Global Brand Manager
Prismo Surfacing Products
Office. 804 213 0335
Cell. 804 319 7456
Fax. 804 213 0337
rbaker@ennispaint.net

Vermont Agency of Transportation
Program Development Division
Materials and Research Section
Phone (802)828-2561 Fax (802)828-2792

To: Jason Aronowitz, Budget Analyst

From: William Ahearn, Materials and Research Engineer
Wendy Kipp, Research Technician via

Date: Tuesday, June 30th, 2009

Subject: Grant Approval for High Friction Surface Overlay

One of the Vermont Agency of Transportation's missions is to "make safety a critical component in the development, implementation and maintenance of the transportation systems…through reducing the number of annual major highway crashes." Given the topographic nature of the nature of state along with Vermont's harsh winter climate, this goal requires the implementation of new technologies intended to make our roadways safer through various means. The evaluation of new technologies is expressly authorized in the federal transportation programs through the use of an experimental feature – by definition an unproven technology or material that shows promise in addressing a transportation problem. These emerging technologies require long term surveillance to verify manufacturer's claims and ensure that the product poses no threats to the traveling public or increased maintenance costs to the tax payers of Vermont.

Ennis Paint of Ennis, Texas produces a new product known as Tyregrip, a patented pavement overlay intended to increase the friction of a roadway surface. They have offered to grant the State approximately 500 square yards for the express purpose of conducting a performance evaluation. In collaboration with the Agency's Highway Safety and Design Section, a high crash location has been nominated for the experimental application, an existing roadway surface within the west bound lane of VT Route 9 in the Town of Woodford at approximately (mile marker) MM 3.0. The roadway alignment is curved with a steep decline at a grade of 8%, only further compounding the problems associated with wet and slippery roads. This location was selected for this project due to a high rate of accidents reported by Highway Safety and Design personnel and local police enforcement. The VTrans' Crash Reporting System documented 13 injuries and 4 fatalities from mile marker MM 2.78 to MM 3.18 from 2000 to 2008 along this roadway segment.

The approximate value of the grant is $13,070 including material and labor. THERE ARE NO DIRECT PAYMENTS UNDER THIS GRANT. Installation will be performed in accordance with all Agency policies. **It is important to note that VTrans is under no current or future obligations to endorse or purchase this product.** The intent of this experimental application is solely to examine product performance over time with respect to accident reduction and durability.

Currently, there are no trial evaluations from any northeast state pertaining to this product. All surveillance and testing will be carried out in accordance with the attached work plan. If possible, the experimental roadway surface will be applied later this summer or early fall as there are minimum ambient application requirements. I respectfully request your approval of the grant.

Prepared By: Wendy Kipp
Date: 6-25-2009

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS AND RESEARCH SECTION

WORK PLAN FOR
RESEARCH INVESTIGATION
Ennis Paint, Inc. Tyregrip High Friction Surface System
Work Plan No. WP 2009-2

OBJECTIVE OF STUDY:

The Vermont roadway network has an abundance of curves and steep inclines due to the varying topographic nature of the state. This coupled with many rural roads and inclement weather can create hazardous roadway conditions for all motorists. Injuries and fatalities along these dangerous locations are problematic not only in Vermont but nationwide. According to the, "Guide for Reducing Collisions on Horizontal Curves," 75 percent of all fatal crashes occur in rural areas and 25 percent are at curves. [FHWA] Many fatalities are from run-off-the road crashes involving single vehicles. In an effort to combat these disheartening statistics, the Federal Highway Administration (FHWA) developed various strategies for state transportation agencies to use as alternative countermeasures in an effort to decrease crashes. Basic strategies incorporate various pavement markings and other traffic control devices. However, in Vermont, due to winter maintenance practices, these basic treatments are often damaged during winter months and are not sufficient in many locations. Subsequently, innovative and experimental treatments are recommended, such as high friction surface overlays.

The purpose of this evaluation is to apply an experimental roadway treatment manufactured by Ennis Paint, Inc. known as Tyregrip, a high friction safety overlay. This system consists of a highly modified exothermic epoxy resin two-part binder that is top dressed with a calcinated bauxite aggregate. Crash data prior to and following installation, as well as skid testing, will be used to evaluate the effectiveness of the treatment with regards to both clear and inclement conditions.

LOCATION:

The experimental feature is to be applied to the existing roadway surface within the west bound lane of VT Route 9 in the Town of Woodford at approximately MM 3.0. The roadway alignment is curved with a steep decline at a grade of 8% as shown in Figure 1, only further compounding the problems associated with wet and slippery roads. The estimated longitudinal length of the application is approximately 266' with a roadway

width of 17', encompassing both the travel lane and shoulder, for a total area of approximately 4522 ft^2.

Figure 1 – Overview View of the Site

This location was selected for this project due to a high rate of accidents reported by Highway Safety and Design personnel and local police enforcement. The VTrans' Crash Reporting System documented 13 injuries and 4 fatalities from mile marker (MM) 2.78 to MM 3.18 from 2000 to 2008 along this roadway segment. In addition, according to Mike Marvin from the Shaftsbury State Police Station, numerous accidents and incidents have been documented all of which are not currently reported within the VTrans's Crash Reporting System. Mike Marvin reported an increase of accidents during the winter months due to the accumulation of ice and snow resulting in a loss of traction.

MATERIAL:

Tyregrip was developed in the United Kingdom (UK) by the Greater London Council (GLC) and is licensed and marketed by Ennis Paint, Inc. of Ennis, Texas. Tyregrip is a patented pavement overlay composed of a highly modified epoxy two part resin binder and surfaced with calcined bauxite, a reported extremely hard aggregate that retains sharp edges and facets over time. This mixture results in a minimum Polished Stone Value (PSV) of 70% for performance durability with high friction properties on wet or dry pavements.

INSTALLATION REQUIREMENTS:

In accordance with the manufacturers' instructions, the two-part modified base epoxy shall to a dry surface. The ambient surface temperature should be between 48°F and 110°F. All surfaces shall be cleaned by use of mechanical sweepers so that the surface is clean, dry, and free of all dust, oil, debris and any other material that might interfere with

the bond between the epoxy binder material and existing surfaces. Surfaces may need to be washed with a mild detergent, rinsed, and dried using a hot compressed air lance. All existing pavement markings shall be removed and all joints and cracks greater than ¼" filled before placement. The treatment can be applied by either hand mixing or mechanical mixing of the epoxy binder. Due to the physical nature of the site, the manufacturer suggests that the mechanical application be used. This method applies the epoxy by a truck mounted application machine onto the pavement section of widths up to 8 feet wide at a minimum coverage rate of 15 gallons per minute with a uniform thickness of 60 mils. Immediately following, the aggregate should be spread at a rate of 13 lbs +/- 2 lbs per square yard up to 8 foot widths. Compaction is not required. At an ambient temperature of 75°F, the curing time is approximately 2 hours. Any excess aggregate should be removed by hand or suction sweeping before the pavement section is reopened to traffic.

COST:

This research initiative is to be a joint effort between the VTrans' Highway Safety and Design Section and manufacturer, Ennis Paint, Inc. Ennis Paint, Inc. is to furnish all associated product relating to the patented system including the epoxy and calcined bauxite aggregate. The manufacturer will also be responsible for the installation of the experimental feature and all associated labor costs. The Highway Safety and Design section is to supply traffic control.

For future reference, Ennis Paint quoted an approximate material cost of $14.64 per square yard. For this application, at a length of 266' and width of 17' this approximate to an approximate area of 503 square yards. Therefore total material cost is approximately $7370. With respect to the cost of installation, Ennis Paint stated that a private contractor may charge somewhere in the vicinity of $26 per square yard for both the cost of materials and labor. Therefore for this application, labor would cost approximately $5700 for a total approximate project cost of $13,070.

It is important to note that VTrans is under no current or future obligations to endorse or purchase this product. The intent of this experimental application is solely to examine product performance over time with respect to accident reduction and durability.

SURVEILLANCE AND TESTING:

In an effort to reduce vehicular accidents due to roadway design, Research personnel will assess the roadway surface overlay in the following manner:

1. Research personnel will monitor and observe all installation activities. This may include any preparation activities as well as application efforts. The time for installation and return of traffic is to be recorded.
2. An annual collection of IRI (international roughness index) is to be collected through the Pavement Management Section.
3. All crash data from 2000 to the present day and throughout the study period is to be collected from the Traffic Research Section and local police records.
4. Visual inspections of the roadway surface, prior to and following application, are to be conducted annually to examine any potential product delamination following application.
5. Two 1' by 1' squares are to be delineated on the surface of the experimental substrate through the use of traffic paint following installation. One is to be identified within a wheel path and one is not to be located in a wheel path. Photographs are to be taken on an annual basis and compared to previous years to determine any loss of aggregate due to vehicle tires or wintertime maintenance activities.
6. Photographs of the overall site are to be collected on an annual basis and any other pertinent information is to be recorded.
7. If feasible, the Standard Method of Test for Frictional Properties of Paved Surfaces Using a Full-Scale Tire (AASHTO T 242-96) is to be performed at several intervals during the experiment. In correlation with this test, the Standard Method of Test for Surface Frictional Properties using the British Pendulum Tester (AASHTO T 278-90) will be utilized to test skid resistance. Five swings per test will be conducted and results averaged to produce a British Pendulum Number (BPN) that may be used to determine the relative effects of skid resistance materials. The BPN will be compared each year to monitor any loss in skid resistance over time.
8. Ennis Paint will be requested to supply a representative sample of the parent aggregate material for testing in accordance with ASTM C 131-06, "Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine." Mass lost through this test method will be compared to other aggregates throughout the state.

DURATION OF THE STUDY:

The duration of this study will be no more than three years or until final conclusions can be drawn from the observations and results from data collection.

REPORTS:

An initial report will be prepared to include the installation of the materials and preliminary observations, with a subsequent final report at the conclusion of the study. Interim reports will be prepared and submitted as needed. These reports will be authored by Research staff.

Agency of Transportation Reviewed By:
Materials and Research Section

William Ahearn P.E.
Materials and Research Engineer
Date: 7/7/2009

References:

Federal Highway Administration. "Low-Cost Treatments for Horizontal Curve Safety." December 2006.

JFO # 2392

VERMONT

State of Vermont
Department of Finance & Management
109 State Street, Pavilion Building
Montpelier, VT 05620-0401

[phone] 802-828-2376
[fax] 802-828-2428

Agency of Administration

STATE OF VERMONT
FINANCE & MANAGEMENT GRANT REVIEW FORM

Grant Summary:	The Ennis Paint Company will supply materials and installation of a road surface treatment intended to reduce winter accidents.				
Date:	8/10/2009				
Department:	AOT Program Development Materials and Research Section				
Legal Title of Grant:	Pavement Surface Treatment Donation				
Federal Catalog #:	N/A				
Grant/Donor Name and Address:	Ennis Paint, Inc. 1509 S. Kaufman, Ennis, TX 75119				
Grant Period: From:	9/1/2009	**To:**	9/1/2009		
Grant/Donation	$13,070 value of materials and installation				

	SFY 1	SFY 2	SFY 3	Total	Comments
Grant Amount:	$13,070	$	$	$	

	# Positions	Explanation/Comments
Position Information:	0	

Additional Comments:	See attached.	
Department of Finance & Management	8/11/09	(Initial)
Secretary of Administration	MFL 8/11/09	(Initial)
Sent To Joint Fiscal Office	8/18/09	**Date**

RECEIVED
AUG 21 2009
JOINT FISCAL OFFICE

STATE OF VERMONT REQUEST FOR GRANT ACCEPTANCE (Form AA-1)

BASIC GRANT INFORMATION	
1. Agency:	Vermont Agency of Transportation
2. Department:	Program Development
3. Program:	Materials and Research Section - Research and Development Unit
4. Legal Title of Grant:	None
5. Federal Catalog #:	None

6. Grant/Donor Name and Address:
Ennis Paint, Inc., 1509 S. Kaufman, Ennis, TX 75119

7. Grant Period:	**From:**	9/1/2009	**To:**	9/1/2009

8. Purpose of Grant:
The Ennis Paint Company will supply materials and installation of a product marketed for increased safety. The installation will be used to evaluate the performance of a proprietary feature intended to reduce or eliminate vehicular accidents by increasing friction on the road's surface (please see attached work plan).

9. Impact on existing program if grant is not Accepted:
Will not have the ability to perform a product assessment to determine if a new pavement surface treatment intended to increase surface friction is durable with respect to Vermont's winter climate and reduces accidents due to downward braking on wet and slippery roads.

10. BUDGET INFORMATION

	SFY 1	SFY 2	SFY 3	Comments
Expenditures:	FY 2009	FY	FY	
Personal Services	$	$	$	
Operating Expenses	$	$	$	
Grants	$	$	$	
Total	$	$	$	
Revenues:				
State Funds:	$	$	$	
Cash	$	$	$	
In-Kind	$	$	$	
Federal Funds:	$	$	$	
(Direct Costs)	$	$	$	
(Statewide Indirect)	$	$	$	
(Departmental Indirect)	$	$	$	
Other Funds:	$	$	$	
Grant (source Ennis Paint)	$13,070	$	$	
Total	$13,070	$	$	

Appropriation No:		**Amount:**	$
			$
			$
			$
			$

STATE OF VERMONT REQUEST FOR GRANT ACCEPTANCE (Form AA-1)

			$
			$
		Total	$

PERSONAL SERVICE INFORMATION

11. Will monies from this grant be used to fund one or more Personal Service Contracts? ☐ Yes ☒ No
If "Yes", appointing authority must initial here to indicate intent to follow current competitive bidding process/policy.

Appointing Authority Name: Agreed by: _____ (initial)

12. Limited Service Position Information:	**# Positions**	**Title**
Total Positions		

12a. Equipment and space for these positions: ☐ Is presently available. ☐ Can be obtained with available funds.

13. AUTHORIZATION AGENCY/DEPARTMENT

I/we certify that no funds beyond basic application preparation and filing costs have been expended or committed in anticipation of Joint Fiscal Committee approval of this grant, unless previous notification was made on Form AA-1PN (if applicable):

Signature: Richard Edwards Date: 7/22/09
Title: VTRANS DIRECTOR OF PROGRAM DEVELOPMENT

Signature: David C Dill Date: 7/23/09
Title: SECRETARY OF TRANSPORTATION

14. ACTION BY GOVERNOR

☑	Check One Box: Accepted		8/15/09
☐	Rejected	(Governor's signature)	Date:

15. SECRETARY OF ADMINISTRATION

☑	Check One Box: Request to JFO	Neale F. Lunderville	8/11/09
☐	Information to JFO	(Secretary's signature or designee)	Date:

16. DOCUMENTATION REQUIRED

Required GRANT Documentation

☐ Request Memo	☐ Notice of Donation (if any)
☐ Dept. project approval (if applicable)	☐ Grant (Project) Timeline (if applicable)
☐ Notice of Award	☐ Request for Extension (if applicable)
☐ Grant Agreement	☐ Form AA-1PN attached (if applicable)
☐ Grant Budget	

End Form AA-1

REC'D JUL 30 2009

From: Richard Baker [rbaker@ennispaint.com]
Sent: Monday, July 13, 2009 7:51 PM
To: Fitch, Jennifer; Kipp, Wendy
Cc: Steve Gainer
Subject: VT DOT Tyregrip trial

Jennifer, Wendy

Please take this email as acceptance of the terms of the Tyregrip trial installation for the Vermont Department of Transportation as follows:

Ennis Paint, Inc

Will supply all labor, equipment, materials and supervisory staff to install a test section of the Tyregrip system for the State of Vermont at the designated location at no cost to the state, the state will provide traffic control at the trial location at no cost to Ennis Paint, Inc.

Ennis Paint, Inc will not request or except any endorsement or promotion of the installation of the Tyregrip system by the state, we do however understand that an evaluation of the installation will be conducted by the state materials office in the future to determine the performance of the installed Tyregrip system.

Many thanks for allowing Ennis Paint, Inc to install the Tyregrip system.

Yours,

Richard J. Baker
On behalf of Ennis Paint, Inc

Richard J. Baker
Ennis Paint Company
Global Brand Manager
Prismo Surfacing Products
Office. 804 213 0335
Cell. 804 319 7456
Fax. 804 213 0337
rbaker@ennispaint.net

Vermont Agency of Transportation
Program Development Division
Materials and Research Section
Phone (802)828-2561 Fax (802)828-2792

To: **Jason Aronowitz, Budget Analyst**

From: **William Ahearn, Materials and Research Engineer**
Wendy Kipp, Research Technician via

Date: **Tuesday, June 30th, 2009**

Subject: **Grant Approval for High Friction Surface Overlay**

One of the Vermont Agency of Transportation's missions is to "make safety a critical component in the development, implementation and maintenance of the transportation systems…through reducing the number of annual major highway crashes." Given the topographic nature of the nature of state along with Vermont's harsh winter climate, this goal requires the implementation of new technologies intended to make our roadways safer through various means. The evaluation of new technologies is expressly authorized in the federal transportation programs through the use of an experimental feature – by definition an unproven technology or material that shows promise in addressing a transportation problem. These emerging technologies require long term surveillance to verify manufacturer's claims and ensure that the product poses no threats to the traveling public or increased maintenance costs to the tax payers of Vermont.

Ennis Paint of Ennis, Texas produces a new product known as Tyregrip, a patented pavement overlay intended to increase the friction of a roadway surface. They have offered to grant the State approximately 500 square yards for the express purpose of conducting a performance evaluation. In collaboration with the Agency's Highway Safety and Design Section, a high crash location has been nominated for the experimental application, an existing roadway surface within the west bound lane of VT Route 9 in the Town of Woodford at approximately (mile marker) MM 3.0. The roadway alignment is curved with a steep decline at a grade of 8%, only further compounding the problems associated with wet and slippery roads. This location was selected for this project due to a high rate of accidents reported by Highway Safety and Design personnel and local police enforcement. The VTrans' Crash Reporting System documented 13 injuries and 4 fatalities from mile marker MM 2.78 to MM 3.18 from 2000 to 2008 along this roadway segment.

The approximate value of the grant is $13,070 including material and labor. THERE ARE NO DIRECT PAYMENTS UNDER THIS GRANT. Installation will be performed in accordance with all Agency policies. **It is important to note that VTrans is under no current or future obligations to endorse or purchase this product.** The intent of this experimental application is solely to examine product performance over time with respect to accident reduction and durability.

Currently, there are no trial evaluations from any northeast state pertaining to this product. All surveillance and testing will be carried out in accordance with the attached work plan. If possible, the experimental roadway surface will be applied later this summer or early fall as there are minimum ambient application requirements. I respectfully request your approval of the grant.

Prepared By: Wendy Kipp
Date: 6-25-2009

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS AND RESEARCH SECTION

WORK PLAN FOR RESEARCH INVESTIGATION

Ennis Paint, Inc. Tyregrip High Friction Surface System
Work Plan No. WP 2009-2

OBJECTIVE OF STUDY:

The Vermont roadway network has an abundance of curves and steep inclines due to the varying topographic nature of the state. This coupled with many rural roads and inclement weather can create hazardous roadway conditions for all motorists. Injuries and fatalities along these dangerous locations are problematic not only in Vermont but nationwide. According to the, "Guide for Reducing Collisions on Horizontal Curves," 75 percent of all fatal crashes occur in rural areas and 25 percent are at curves. [FHWA] Many fatalities are from run-off-the road crashes involving single vehicles. In an effort to combat these disheartening statistics, the Federal Highway Administration (FHWA) developed various strategies for state transportation agencies to use as alternative countermeasures in an effort to decrease crashes. Basic strategies incorporate various pavement markings and other traffic control devices. However, in Vermont, due to winter maintenance practices, these basic treatments are often damaged during winter months and are not sufficient in many locations. Subsequently, innovative and experimental treatments are recommended, such as high friction surface overlays.

The purpose of this evaluation is to apply an experimental roadway treatment manufactured by Ennis Paint, Inc. known as Tyregrip, a high friction safety overlay. This system consists of a highly modified exothermic epoxy resin two-part binder that is top dressed with a calcinated bauxite aggregate. Crash data prior to and following installation, as well as skid testing, will be used to evaluate the effectiveness of the treatment with regards to both clear and inclement conditions.

LOCATION:

The experimental feature is to be applied to the existing roadway surface within the west bound lane of VT Route 9 in the Town of Woodford at approximately MM 3.0. The roadway alignment is curved with a steep decline at a grade of 8% as shown in Figure 1, only further compounding the problems associated with wet and slippery roads. The estimated longitudinal length of the application is approximately 266' with a roadway

width of 17', encompassing both the travel lane and shoulder, for a total area of approximately 4522 ft^2.

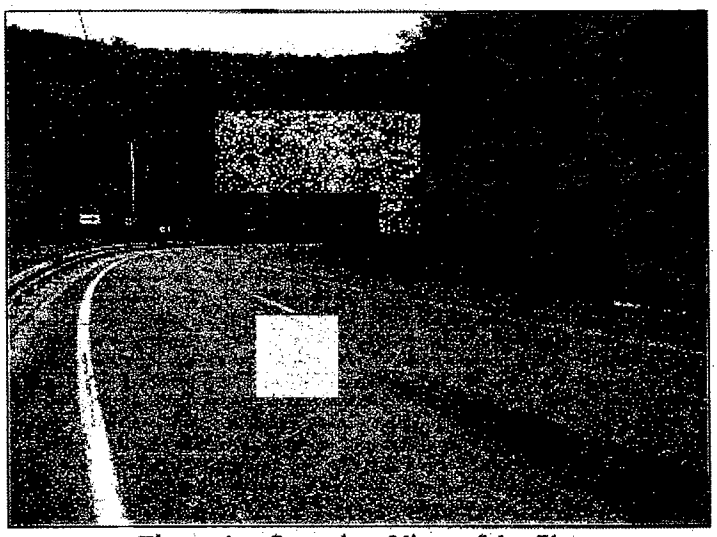

Figure 1 – Overview View of the Site

This location was selected for this project due to a high rate of accidents reported by Highway Safety and Design personnel and local police enforcement. The VTrans' Crash Reporting System documented 13 injuries and 4 fatalities from mile marker (MM) 2.78 to MM 3.18 from 2000 to 2008 along this roadway segment. In addition, according to Mike Marvin from the Shaftsbury State Police Station, numerous accidents and incidents have been documented all of which are not currently reported within the VTrans's Crash Reporting System. Mike Marvin reported an increase of accidents during the winter months due to the accumulation of ice and snow resulting in a loss of traction.

MATERIAL:

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INSTALLATION REQUIREMENTS:

In accordance with the manufacturers' instructions, the two-part modified base epoxy shall to a dry surface. The ambient surface temperature should be between 48°F and 110°F. All surfaces shall be cleaned by use of mechanical sweepers so that the surface is clean, dry, and free of all dust, oil, debris and any other material that might interfere with

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COST:

This research initiative is to be a joint effort between the VTrans' Highway Safety and Design Section and manufacturer, Ennis Paint, Inc. Ennis Paint, Inc. is to furnish all associated product relating to the patented system including the epoxy and calcined bauxite aggregate. The manufacturer will also be responsible for the installation of the experimental feature and all associated labor costs. The Highway Safety and Design section is to supply traffic control.

For future reference, Ennis Paint quoted an approximate material cost of $14.64 per square yard. For this application, at a length of 266' and width of 17' this approximate to an approximate area of 503 square yards. Therefore total material cost is approximately $7370. With respect to the cost of installation, Ennis Paint stated that a private contractor may charge somewhere in the vicinity of $26 per square yard for both the cost of materials and labor. Therefore for this application, labor would cost approximately $5700 for a total approximate project cost of $13,070.

It is important to note that VTrans is under no current or future obligations to endorse or purchase this product. The intent of this experimental application is solely to examine product performance over time with respect to accident reduction and durability.

SURVEILLANCE AND TESTING:

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1. Research personnel will monitor and observe all installation activities. This may include any preparation activities as well as application efforts. The time for installation and return of traffic is to be recorded.
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Agency of Transportation Reviewed By:
Materials and Research Section

William Ahearn P.E.
Materials and Research Engineer
Date: 7/7/2009

References:

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It is important to note that VTrans is under no current or future obligations to endorse or purchase this product. The intent of this experimental application is solely to examine product performance over time with respect to accident reduction and durability.

SURVEILLANCE AND TESTING:

In an effort to reduce vehicular accidents due to roadway design, Research personnel will assess the roadway surface overlay in the following manner:

1. Research personnel will monitor and observe all installation activities. This may include any preparation activities as well as application efforts. The time for installation and return of traffic is to be recorded.
2. An annual collection of IRI (international roughness index) is to be collected through the Pavement Management Section.
3. All crash data from 2000 to the present day and throughout the study period is to be collected from the Traffic Research Section and local police records.
4. Visual inspections of the roadway surface, prior to and following application, are to be conducted annually to examine any potential product delamination following application.
5. Two 1' by 1' squares are to be delineated on the surface of the experimental substrate through the use of traffic paint following installation. One is to be identified within a wheel path and one is not to be located in a wheel path. Photographs are to be taken on an annual basis and compared to previous years to determine any loss of aggregate due to vehicle tires or wintertime maintenance activities.
6. Photographs of the overall site are to be collected on an annual basis and any other pertinent information is to be recorded.
7. If feasible, the Standard Method of Test for Frictional Properties of Paved Surfaces Using a Full-Scale Tire (AASHTO T 242-96) is to be performed at several intervals during the experiment. In correlation with this test, the Standard Method of Test for Surface Frictional Properties using the British Pendulum Tester (AASHTO T 278-90) will be utilized to test skid resistance. Five swings per test will be conducted and results averaged to produce a British Pendulum Number (BPN) that may be used to determine the relative effects of skid resistance materials. The BPN will be compared each year to monitor any loss in skid resistance over time.
8. Ennis Paint will be requested to supply a representative sample of the parent aggregate material for testing in accordance with ASTM C 131-06, "Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine." Mass lost through this test method will be compared to other aggregates throughout the state.

DURATION OF THE STUDY:

The duration of this study will be no more than three years or until final conclusions can be drawn from the observations and results from data collection.

REPORTS:

An initial report will be prepared to include the installation of the materials and preliminary observations, with a subsequent final report at the conclusion of the study. Interim reports will be prepared and submitted as needed. These reports will be authored by Research staff.

Agency of Transportation Reviewed By:
Materials and Research Section

William Ahcarn P.E.
Materials and Research Engineer
Date: 7/7/2009

References:

Federal Highway Administration. "Low-Cost Treatments for Horizontal Curve Safety." December 2006.