

EVALUATION OF THERMOPLASTIC
PAVEMENT MARKINGS ON
VERMONT ROUTES 15 & 100

INITIAL REPORT 87-5

MARCH 1987

REPORTING ON WORK PLAN 83-R-29

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION

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ACKNOWLEDGMENT

This project was performed in cooperation with the U. S. Department of Transportation, Federal Highway Administration, as a Category II Experimental Project under the HPR-PR Program.

"The information contained in this Report was compiled for the use of the Vermont Agency of Transportation. Conclusions and recommendations contained herein are based upon the research data obtained and the expertise of the researchers, and are not necessarily to be construed as Agency policy. This Report does not constitute a standard, specification, or regulation. The Vermont Agency of Transportation assumes no liability for its contents or the use thereof."

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ABSTRACT

A desire to evaluate durable pavement marking materials which could be applied over worn traffic paint led to the field trial discussed in this report. The material selected, a hydrocarbon thermoplastic manufactured and applied by Safety Lines Industries of Boston, Massachusetts was applied in August 1983 on 2.1 miles of Route 15 and 1.39 miles of Route 100 in the Towns of Morristown and Hyde Park.

The application was carried out without difficulty using a manually operated hand liner under good weather conditions. The material was paid for at a cost of \$0.34 per linear foot installed.

Field observations were made seven times during the 40 month evaluation period. The inspections did not reveal any loss of thermoplastic markings resulting from the presence of underlying traffic paint.

The thermoplastic markings were much more durable than traffic paint but the performance of the material is subject to snowplow damage and bond failure in addition to normal abrasion failure under traffic.

A complete loss of material occurred in the wheelpaths on stop bars within 23 months of service.

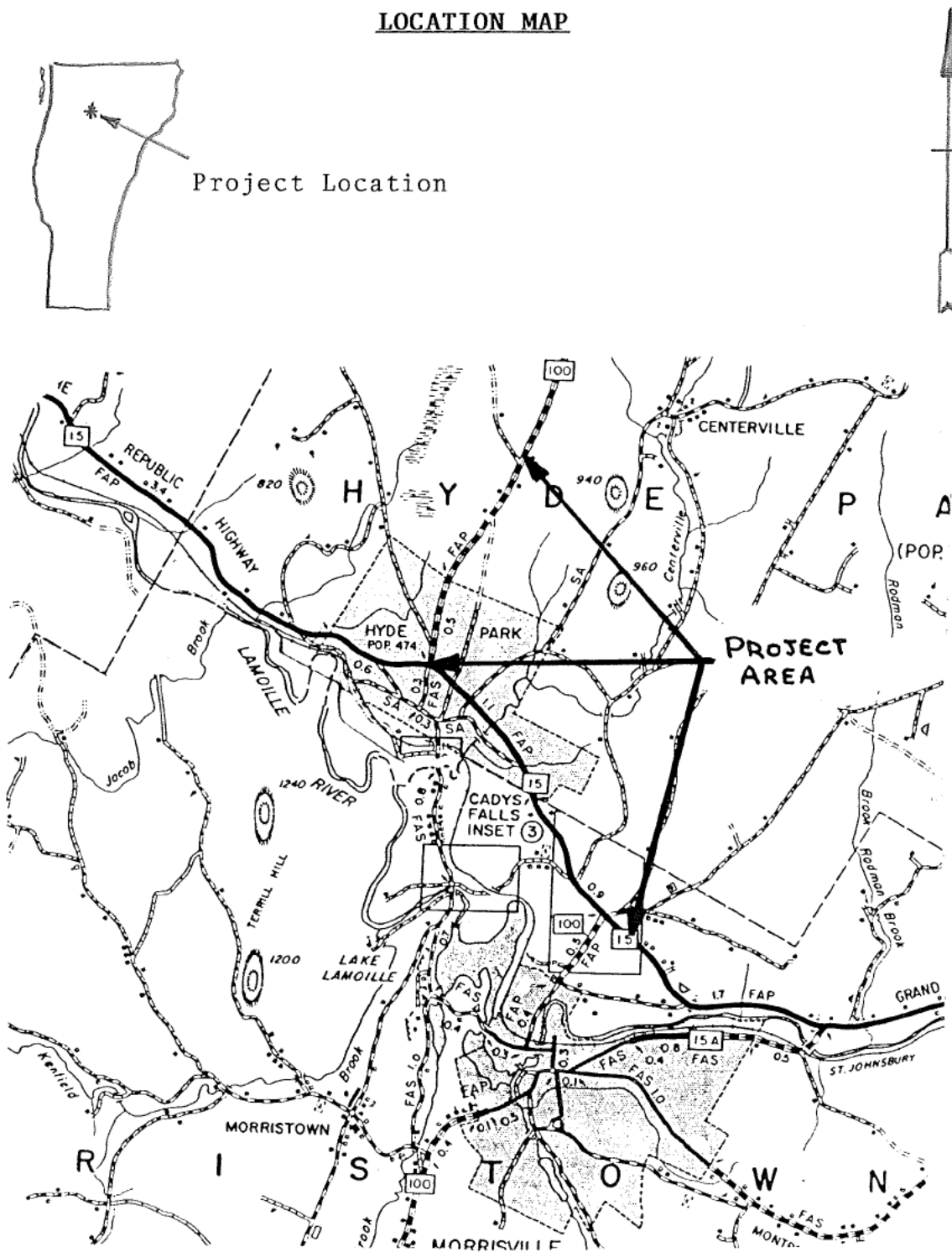
The loss of centerline delineation on Route 100 was the result of traffic wear almost exclusively while the loss on Route 15 was mainly the result of bond failure or snowplow damage. Excellent initial nighttime reflectivity decreased quickly with the loss of surface beads, much like that which occurs with traffic paint. The loss of delineation at 40 months suggests that restriping will be justified on 10 to 15 percent of the project in 1987.

INTRODUCTION

The current policy of the Vermont Agency of Transportation requires that pavement markings be applied daily on bituminous paving projects for the safety of the traveling public. Due to the relatively small amounts of marking required at the end of each paving day, the scattered location of the projects, and the absence of local pavement marking contractors equipped to apply the newer class of durable marking materials, traffic paint is the logical choice for initial pavement delineation. A desire to apply and evaluate durable marking materials led to a review of products which could be applied over existing traffic paint. Of the materials available, thermoplastic was given the best chance of performing satisfactorily when applied over one year old traffic paint worn thin by the effect of traffic, snowplows, and abrasion from winter sand and salting. Based on this information, the Agency let a negotiated contract for the application of approximately 10,000 linear feet of thermoplastic pavement marking on Vermont Route 15 and 100 in the Towns of Hyde Park and Morristown in August, 1983.

This Report covers the application of the material and discusses performance through 40 months of service.

LOCATION MAP



Thermoplastic pavement marking application on Routes 15 and 100 in the Towns of Morristown and Hyde Park.

PROJECT DESCRIPTION & ROADWAY CONDITION

Sections of Route 15 in Morristown and Hyde Park and Route 100 in Hyde Park were selected to receive centerline applications of thermoplastic. The application on Route 15 spanned 2.1 miles from MM 1.79 in Hyde Park, 190 feet west of the junction of Route 100 to MM 1.00 in Morristown, 685 feet east of the junction of Route 100. The application on Route 100 spanned 1.39 miles from the junction of Route 15 at MM 0.00 to a point 1.39 miles north at MM 1.39 in the Town of Hyde Park. The test sites had been paved in 1982 with a surface course consisting of 1½ inches of Vermont's Type III mix which contains a maximum aggregate size of ½ inch. All paving was completed by October 28, 1982.

The pavement on both Routes was in good condition in 1983 prior to the thermoplastic application. Cracks were few in number and there were no other types of distress. The alkyd traffic paint which had been applied by State Traffic Shop personnel appeared very faded and worn following ten months of exposure. The markings had been exposed to average daily traffic (ADT) of 5,370 vehicles on Route 15 and up to 1,970 vehicles on Route 100. The paint loss ranged from 5 to 85 percent on Route 15 with a project wide average of 50 percent. Paint loss was estimated at an average of 75 percent on Route 100 even though traffic volumes were less than those reported on Route 15. The paint loss was so dramatic on some portions of Route 100 that the contractor took time to snap a chalk line to insure the satisfactory alignment of the thermoplastic line.



Condition of ten month old traffic paint at test area #1 on Route 15. Paint loss estimated at 5 percent on the left and 20 percent on the right.



Condition of ten month old traffic paint at test area #9 on Route 15. Paint loss estimated at 85 percent on the top line and 25 percent on the bottom.

THERMOPLASTIC MATERIAL

The thermoplastic material used in this field test was manufactured and applied by Safety Lines Industries, Inc. of 765 Summer Street, Boston, Massachusetts 02127 (Phone 617-268-9850). The company routinely manufactures thermoplastic material which meets the specification requirements for Massachusetts, Rhode Island and New York. The material supplied for this field test was a hydrocarbon thermoplastic manufactured to meet 1983 specifications for Massachusetts and Rhode Island material. The requirement for yellow thermoplastic included a minimum of 22 percent binder and 20 percent glass beads by weight with the remainder consisting of yellow pigment, calcium carbonate, and inert fillers. The thermoplastic was supplied in 50 pound cakes.

THERMOPLASTIC APPLICATION

The thermoplastic application was carried out on August 24 and 25, 1983. Good weather conditions prevailed prior to and during the application. Skies were clear both days and air temperatures ranged between 64°F at start up and 82°F by mid-afternoon. With the exception of short shaded sections at the start up each morning, pavement surface temperatures ranged from 84°F to 124°F. Pavement surface temperatures in the shaded areas were in the mid 50 degree range both mornings.

The thermoplastic, which was supplied in 50 pound cakes, was broken into smaller segments and placed in twin thermostatically controlled oil bath kettles mounted on the rear of a flat bed truck. Upon attaining the required

temperature range of 400°F to 425°F, molten material was transferred via a chute to a manually operated hand liner provided for the application.



Charging the hand liner with hot thermoplastic

The hand liner had a capacity of approximately 250 pounds of thermoplastic enabling it to apply 625± linear feet of four inch wide by 125 mil thick line prior to recharging. The applicator featured propane heating of the storage compartment and a manual agitator to provide some circulation of the material to prevent scorching during idle periods. Glass beads stored in a compartment on the rear of the unit were fed by gravity over the hot thermoplastic line. The kettle truck followed the hand liner protecting it and the operator from traffic approaching from the rear. Because the hand liner was only capable of applying a single line, it was necessary to traverse the entire length of the project a second time to complete areas requiring a double line.

Reflective glass beads were automatically dropped on the line at a rate of six pounds per gallon of thermoplastic. This was approximately the same amount which would normally be applied on painted lines.

The extruded thermoplastic line reached a tack free condition in approximately 45 seconds and resisted indentation under finger pressure within 1½ minutes. There were no cases where the two-way traffic picked up or tracked the fresh material.

The line width averaged 4¼ inches and thickness measurements made with a micrometer caliper varied from 89 to 113 mils with an average of 104 mils. With the exception of the line thickness averaging less than the 125 mils desired, there were no significant problems noted during the two day application.

MATERIAL COST

The material was paid for at a cost of \$0.34 per linear foot which included all aspects of the operation including traffic control. A total of 30,547 linear feet of centerline was applied at a total cost of \$10,385.98.

As a matter of comparison, the State Traffic Shop crews routinely apply alkyd traffic paint at a cost of \$0.04± per linear foot which includes labor, equipment and material costs. The centerlines treated with thermoplastic in this field test would require yearly applications of traffic paint to provide minimum delineation for the traveling public.

FIELD EXPOSURE CONDITIONS

The test site is located in an area which has a mean freezing index of 1450. Freeze-thaw cycles average 90 per year and snowfall averages 100 inches. During the first winter of service, there were 45 snow days which resulted in approximately 330 plow passes on Route 15 and 440 plow passes on Route 100. The winter of 1984-1985 had 43 snowdays which resulted in 385 more plow passes on Route 15 and 405 on Route 100. Although records were not tabulated, similar conditions occurred during the 1985-1986 winter season.

Average daily traffic has ranged from 4,990 to 9,200 on various sections of Route 15 and 1,590 to 2,150 on Route 100 during the evaluation period.

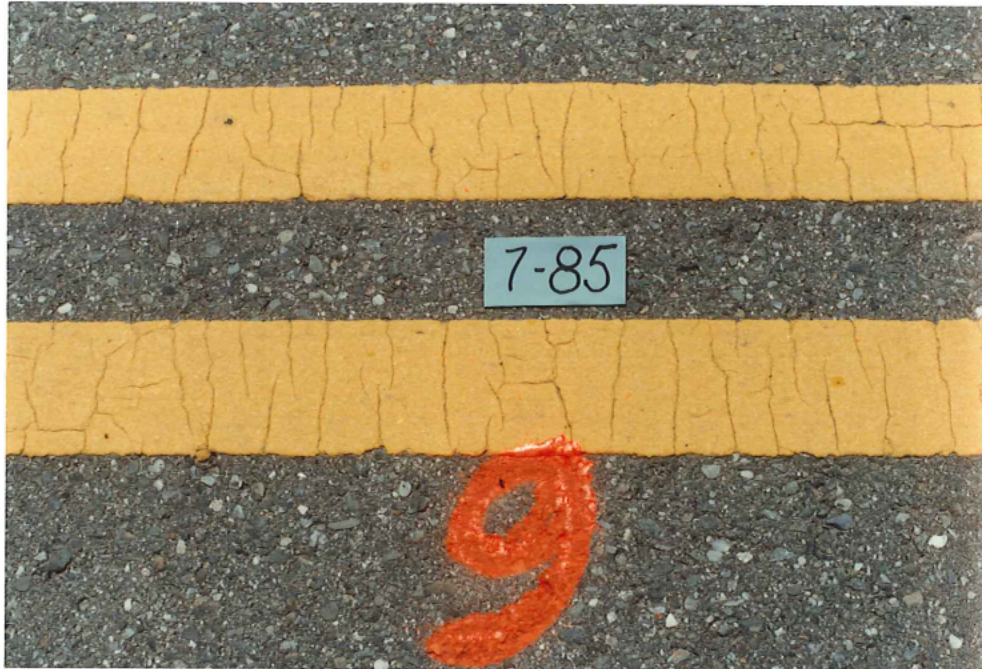
DISCUSSION OF PERFORMANCE

The project was inspected seven times during the 40 month evaluation period. The observations were made at 5 months (January 25, 1984), 6 months (February 14, 1984), 11 months (July 19, 1984, 16 months (December 17, 1984), 23 months (July 16, 1985), 31 months (March 26, 1986), and 40 months (December 23, 1986). The observations generally included photographs taken at 12 specific locations.

Detailed comments recorded at the time of application can be seen in Appendix A on pages 17 to 23. Noteworthy conditions include the following:

Cracks In The Thermoplastic - Occasional fine transverse cracks were noted in the material at the five month inspection.

The number of cracks increased soon after and were joined on occasion by random or longitudinal cracks. As the length of exposure increased there was some erosion of the material at the top interfaces of the cracks but loss of line due to the cracks has been limited to occasional small chips missing along the edges at the intersection of cracks.



Note cracks in thermoplastic lines @ 23 months of service

Wear - Some wear was noted on the stop bars at the 5 month inspection. The wear had increased substantially at the 11 month inspection and could also be observed where turning movements crossed the centerline at the more popular local businesses. Between the 16 month and 23 month inspections, traffic had worn through the stop bar markings in the wheelpaths. At 23 months, very significant wear was also noted on the double yellow lines on Route 100 between the junction of Route 15 and the first side road. Fifty percent of the easterly line was worn away in that area while about 5 percent of the westerly line was missing. Wear loss on the remainder of Route 100

averaged only two percent. A very small part of the loss appeared due to snowplows shaving the line where the pavement surface was uneven. At 31 months, wear loss had increased to 15 percent on the remainder of the easterly side of the double line on Route 100. The loss at 40 months was estimated at 20 percent with about 3 percent loss on the westerly line.



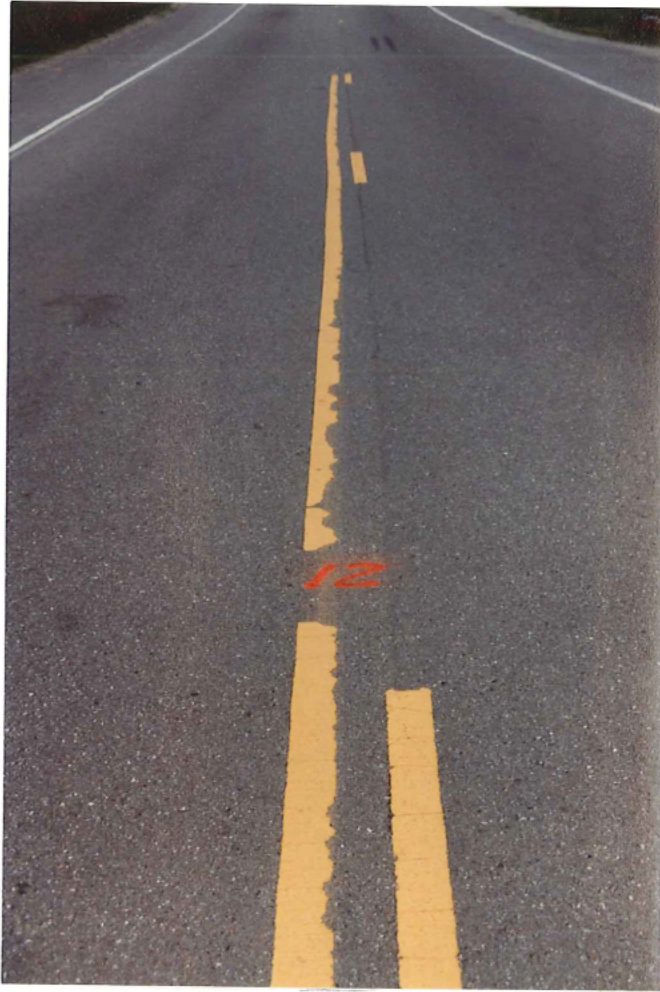
Wear loss estimated @ 15% on easterly side, Route 100 @ 31 months

The reason for the significant difference in performance between the two parallel lines on Route 100 is not known. It is suspected that some increase in wear may be due to the fact that northbound vehicles are climbing upgrade along the easterly line and the traffic is crowding the centerline due to the narrow unpaved shoulders with severe tire abrasion the end result. Overall, wear loss was much greater on Route 100 than on Route 15 even though traffic volumes are three times as great on Route 15. The wide paved shoulders on Route 15 are credited with extending the life of the markings due to less encroachment of traffic on the centerline.

The portions of the centerline abutting the thermoplastic lines have been restriped with traffic paint on an annual basis.

Loss Of Line - The loss of line other than that caused by traffic wear was the result of snowplow damage or lack of bond to the pavement. Initially, the loss was limited to an inch or so of the leading edge of 10 foot strips. Within 16 months, one third of the stripes had lost an average of six inches of line. The loss of line due to snow plow damage was confined almost exclusively to Route 15. The difference may be due to the type of snowplow blades used on the two routes. District 8 which maintains the Route 100 portion of the project uses carbide blades backed by a 3/4 inch thick steel blade. District 6 which maintains the Route 15 portion uses steel blades only.

Through the 40 month period the majority of the loss occurred on a quarter mile portion of the 2.1 mile Route 15 project between MM 0010 and 0035. Within that area, the loss included edge scalloping and gradual complete loss of skip lines. The loss cannot be related to any specific item such as pavement condition or the amount of traffic paint present prior to application. A large number of pits or craters were noted in the thermoplastic in the area where losses occurred. They may suggest that moisture was present in the pavement at the time of application or that the material temperature was outside the normal range.



Bond loss/edge scalloping @ MM0030± on Route 15
Photo taken on 7/19/84 after 11 months of exposure

Delineation - In general, it appears that the thermoplastic markings have provided a greater level of delineation than that which would have been provided by yearly applications of traffic paint. An exception to the above statement would include areas where line loss has occurred due to loss of bond or heavy traffic wear. The nighttime reflectivity was excellent initially but decreased quickly with the loss of surface beads much like that which occurs with new traffic paint applications. Following the first winter season, the markings remained visible at night due more to the color contrast with the pavement than

due to reflectivity values provided by the glass beads embedded in the thermoplastic.



Thermoplastic lines on Route 15 after 31 months of service

Traffic Safety - The project was reviewed in an attempt to determine if the pavement markings improved traffic safety within the project area. The thermoplastic markings are believed to have provided better delineation than that which would have been expected from traffic paint. However, more accidents (25) occurred during the two years following the field test than the number which occurred (18) in the two years prior to the test. The number of accidents occurring on any section of highway are subject to any number of variables and the results noted in this before and after survey are not believed to be directly related to the performance of the traffic markings.

SUMMARY

This field test of thermoplastic pavement marking material supports the following preliminary findings.

There has been no loss of thermoplastic material due to the presence of underlying traffic paint.

The thermoplastic markings were much more durable than traffic paint but the performance of the material is subject to snowplow damage and bond failure in addition to normal abrasion failure under traffic.

Cracks which developed in the material did not affect overall performance.

A complete loss of material occurred in the wheelpaths on stop bars within 23 months of service.

The loss of centerline delineation on Route 100 was the result of traffic wear almost exclusively.

The loss of centerline delineation on Route 15 was mainly the result of bond failure or snowplow damage.

Excellent initial nighttime reflectivity decreased quickly with the loss of surface beads, much like that which occurs with traffic paint. The long-term delineation appears due more to the contrast between the yellow markings and the gray/black pavement than due to reflectivity of embedded glass beads.

The improved delineation provided by the thermoplastic markings did not reduce the overall number of traffic accidents on the project site.

The initial cost of the markings was approximately eight times that for traffic paint applied by State Forces. However, the benefit of having year round delineation must be taken into account when considering the cost/benefit ratio of the durable markings.

The loss of delineation at 40 months suggests that restriping will be justified on 10 to 15 percent of the project in 1987.

PRELIMINARY CONCLUSIONS

This field trial suggests that thermoplastic pavement markings can perform satisfactorily when applied over worn traffic paint.

The thermoplastic material is much more durable than Vermont's standard traffic paint and therefore it provided better delineation than that which could have been expected from traffic paint, but it does not appear that the thermoplastic lines will last for the anticipated eight year life of the pavement.

RECOMMENDATION

The Maintenance Division should consider restriping areas with significant loss of delineation in 1987.

FOLLOWUP

Monitoring will continue on this project.

Appendix A

VT. A.O.T.
MAT. & RES. DIVISION

PAVEMENT MARKING EVALUATION FORM

ROUTE: 15 & 100 Morristown & Hyde Park TYPE MATERIAL: Thermoplastic
MONTHS OF EXPOSURE: 5 MARKING PATTERN: Center line & Stop Bars
INSPECTION BY: R. Frascaio DATE: JAN 25, 1984

PERFORMANCE AND CONDITION

WEAR: Some wheel path wear on stop bar at intersection of Rte 15 & 100
in Morristown

LOSS OF LINE: One inch avg. loss on leading edge of 20% of all
stripes on Rte 15. No loss on Rte 100
Edge scallaping noted at a few locations with the greatest loss over
a 400 foot length of Rte 15 at MM 0040±. A single 3 foot loss on Rte
100.

MISCELLANEOUS: A few fine transverse cracks visible in the thermoplastic
Crater like pits noted at various locations. Some areas free of pitting
while others have up to 40 per linear foot of line.

OVERALL RATING:

	Rte. 15	Rte. 100
Appearance:	<u>very good</u>	<u>excellent</u>
Durability:	<u>good</u>	<u>excellent</u>
Night Visibility:	<u>not checked</u>	<u>not checked</u>

COMMENTS: The crater-like pits may have been due to a variation from
the normal 400°F to 425°F material temperature or the presence of
moisture in the pavement.

Appendix A

VT. A.O.T.
MAT. & RES. DIVISION

PAVEMENT MARKING EVALUATION FORM

ROUTE: 15 & 100 Morristown & Hyde Park TYPE MATERIAL: Thermoplastic
MONTHS OF EXPOSURE: 6 MARKING PATTERN: Centerline & Stop Bars
INSPECTION BY: R. Frascaia DATE: Feb 14, 1984

PERFORMANCE AND CONDITION

WEAR: Noted in wheelpaths on stop bars and where turning movements cross center line

LOSS OF LINE: One to eight inch loss on the leading edge of 25 % of all stripes on Rte 15. No loss on Rte 100.

MISCELLANEOUS: Fine transverse cracks present at one to two inch intervals. Cracks are occasionally connected by random or longitudinal cracks.

OVERALL RATING:

	Rte. 15	Rte. 100
Appearance:	<u>Very good</u>	<u>Excellent</u>
Durability:	<u>Good</u>	<u>Excellent</u>
Night Visibility:	<u>Not checked</u>	<u>Not checked</u>

COMMENTS: _____

Appendix A

VT. A.O.T.
MAT. & RES. DIVISION

PAVEMENT MARKING EVALUATION FORM

ROUTE: 15 & 100 Morristown & Hyde Park TYPE MATERIAL: Thermoplastic
MONTHS OF EXPOSURE: 11 MARKING PATTERN: Centerline & Stop Bars
INSPECTION BY: R. Frascaia DATE: July 19, 1984

PERFORMANCE AND CONDITION

WEAR: Substantial wear through on stop bar on Rte 100 at junction of Rte 15 in Morristown. Also where turning movements cross centerline.

LOSS OF LINE: Six inch avg loss on the leading edge of 35% of all stripes on Rte 15. Significant loss of line noted in the area of MM 0040 on Rte 15.

MISCELLANEOUS: _____

OVERALL RATING:

	Rte. 15	Rte. 100
Appearance:	<u>Good</u>	<u>Excellent</u>
Durability:	<u>Fair to Good</u>	<u>Very Good</u>
Night Visibility:	<u>Not checked</u>	<u>Not checked</u>

COMMENTS: Weak bond noted between thermoplastic and pavement where edge scalloping has occurred at MM 0040 ±. Able to lift material with fingernail.
The centerline needs repainting off the ends of the project.

Appendix A

VT. A.O.T.
MAT. & RES. DIVISION

PAVEMENT MARKING EVALUATION FORM

ROUTE: 15 & 100 Morrisstown & Hyde Park TYPE MATERIAL: Thermoplastic
MONTHS OF EXPOSURE: 16 MARKING PATTERN: Centerline & Stop Bars
INSPECTION BY: R. Frascione DATE: Dec 17, 1984

PERFORMANCE AND CONDITION

WEAR: Significant wear noted on stop bars and where turning movements cross centerline.
Noted several locations on Rte 100 where snowplows had shaved the thermoplastic where the pavement surface was uneven.

LOSS OF LINE: Six inch avg loss on the leading edge of 35% of all 10 foot stripes and significant loss of solid and skip lines in the area of MM 0040 on Rte 15.
Edge scalloping present on two percent of Rte 15 lines mainly in the area of MM 0040, almost none on Rte 100.

MISCELLANEOUS: _____

OVERALL RATING:

	Rte. 15	Rte. 100
Appearance:	<u>Fair to Good</u>	<u>Very Good</u>
Durability:	<u>Fair to Good</u>	<u>Good</u>
Night Visibility:	<u>Not checked</u>	<u>Not checked</u>

COMMENTS: _____

Appendix A

VT. A.O.T.
MAT. & RES. DIVISION

PAVEMENT MARKING EVALUATION FORM

ROUTE: 15 & 100 Morrisstown & Hyde Park TYPE MATERIAL: Thermoplastic
MONTHS OF EXPOSURE: 23 MARKING PATTERN: Centerline & Stop Bars
INSPECTION BY: R. Frascaia DATE: July 16, 1985

PERFORMANCE AND CONDITION

WEAR: Approximately 50% of the east side of the double yellow line on Rte 100 has worn away between Jct of Rte 15 and first side road (572'). The adjacent line has less overall wear except near the intersection.
Wear on Rte 15 limited to stop bars and centerline in vicinity of intersections. The stop bars have 100% loss in the wheel paths.

LOSS OF LINE: Rte 15 in the area of MM 0035 has extensive loss of line including edge scalloping over a 935 foot area.
Some loss of leading edge of 10 foot stripes on Rte 15 but no similar loss on Rte 100.

MISCELLANEOUS: Night visibility - Able to see 4 skip lines on low beam, 7 on high beam on Rte 15. Able to see 5 skip lines on low beam, 8 on high beam on Rte 100.

OVERALL RATING:

	Rte. 15	Rte. 100
Appearance:	<u>Fair</u>	<u>Good</u>
Durability:	<u>Fair</u>	<u>Fair to Good</u>
Night Visibility:	<u>Fair to Good</u>	<u>Good</u>

COMMENTS: The nighttime visibility may be due more to the contrast between the yellow line and the black/gray pavement than to actual reflectivity of the markings

Appendix A

VT. A.O.T.
MAT. & RES. DIVISION

PAVEMENT MARKING EVALUATION FORM

ROUTE: 15 & 100 Morristown & Hyde Park TYPE MATERIAL: Thermoplastic
MONTHS OF EXPOSURE: 31 MARKING PATTERN: Center line & Stop Bars
INSPECTION BY: R. Frascaia DATE: March 26, 1986

PERFORMANCE AND CONDITION

WEAR: Estimate 15 % loss of the east side of the double line on
Rte 100.

LOSS OF LINE: Includes 50 to 100 % of 10' skip lines between MM
0025 & 0035. Material remaining in area of greatest loss is wearing
thin, contains more cracks and has more pits or craters (30-50) per
linear foot of line than in areas with good performance.

MISCELLANEOUS: Cracks in the pavement were sealed with hot applied
crack filler in the late summer or fall of 1985. Where the paving
joint opened along the center line, the crack filler covered a portion
of the markings.

OVERALL RATING:

	Rte. 15	Rte. 100
Appearance:	<u>80% Fair, 20% Poor</u>	<u>Fair</u>
Durability:	<u>80% Fair, 20% Poor</u>	<u>Fair</u>
Night Visibility:	<u>Not checked</u>	<u>Not Checked</u>

COMMENTS: _____

Appendix A

VT. A.O.T.
MAT. & RES. DIVISION

PAVEMENT MARKING EVALUATION FORM

ROUTE: 15 & 100 Morrisstown & Hyde Park TYPE MATERIAL: Thermoplastic
MONTHS OF EXPOSURE: 40 MARKING PATTERN: Center Line & Stop Bars
INSPECTION BY: R. Frascio DATE: December 23, 1986

PERFORMANCE AND CONDITION

WEAR: Increased wear showing at intersections of Rte 15 & 100
Wear loss visible on sweeping curve west of Charlmont Restaurant
Up to 100 % wear loss on easterly line on Rte 100 with remaining
material getting thin. Estimate avg loss for 1.4 mile section at 20 %
for easterly line and 3 % for westerly line.

LOSS OF LINE: Some additional loss of skip lines between MM 0010
and 0035

MISCELLANEOUS: Losing small chips of material along line edge
at the intersection of some of the transverse cracks in the
thermoplastic

OVERALL RATING:

	Rte. 15	Rte. 100
Appearance:	<u>75% Fair, 25 % Poor</u>	<u>70% Fair, 30% Poor</u>
Durability:	<u>75% Fair, 25% Poor</u>	<u>70% Fair, 30% Poor</u>
Night Visibility:	<u>Not Checked</u>	<u>Not Checked</u>

COMMENTS: _____

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION

WORK PLAN FOR
CATEGORY II EXPERIMENTAL PROJECT
THERMOPLASTIC PAVEMENT MARKING MATERIAL

WORK PLAN 83-R-29

OBJECTIVE OF EXPERIMENT

To evaluate the performance of a thermoplastic pavement marking material when applied as center line and edge lines over one year old traffic paint.

PROJECT

Statewide PMS 000S(3)
Morrisville-Hyde Park

PROJECT LOCATION

On Vermont Routes 15 and 100 in the Hyde Park area.

EXPERIMENTAL WORK LOCATION

The center line and edge lines will be applied on approximately 3 miles of roadway. The exact marking locations will be selected by Traffic Shop and Materials & Research Division personnel prior to application.

MATERIALS TO BE USED

Thermoplastic marking material manufactured and applied by Safety Lines Industries, Inc., 76 Summer Street, South Boston, MA 02127, Phone 617-268-9852.

APPLICATION PROCEDURE

The thermoplastic marking material shall be applied by extrusion using hand operated equipment. The application shall be as recommended by the manufacturer.

CONTROL SECTION AND TREATMENT

The Agency's standard traffic paint shall be applied on the adjacent roadway for comparison purposes.

COST

The material will be applied at a cost of \$0.34 per linear foot for center and edge lines. The total cost of the installation will be approximately \$10,200.00.

DATE OF INSTALLATION

Prior to August 1, 1983.

DURATION OF STUDY

The project will be evaluated for the length of time required to obtain valid conclusions on the performance of the material.


SURVEILLANCE

The experimental and control materials shall be monitored during application and visually inspected on a semi-annual schedule for the duration of the study. The surveillance shall include photographic documentation for the life of both experimental and control treatments. The durability of the marking materials shall be evaluated with respect to bond failure, snowplow shear failure, and abrasion resistance. The materials will also be rated for daytime appearance and nighttime reflectivity. A before and after accident study shall be conducted to determine if the pavement markings improve traffic safety within the project area.

REPORTS

An initial report covering the installation and initial observations and a final report drawing conclusions on the effectiveness of the experimental materials shall be submitted to the Federal Highway Administration.

Reviewed By:



R. F. Nicholson, P.E.
Materials & Research Engineer

Date: June 30, 1983

Approved FHWA 9-6-83