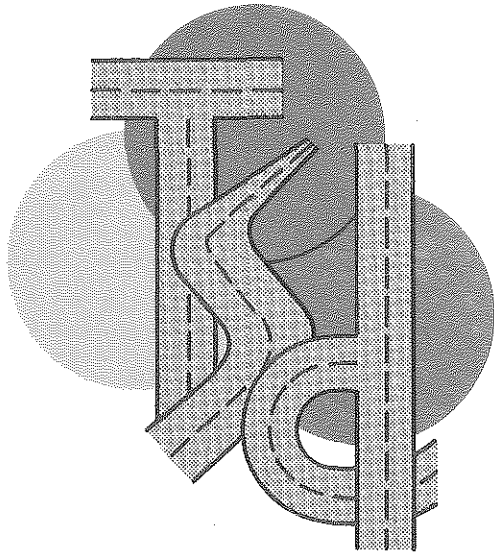


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FIELD EVALUATION  
OF  
REFLECTIVE DELINEATION MARKERS

TSD-TR-121-69



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FIELD EVALUATION  
OF  
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By

Herbert Schoepke

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Traffic Research Section  
Traffic & Safety Division

July 1969

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## INTRODUCTION

In September of 1965, a study was undertaken by the Traffic and Safety Division to perform a field evaluation of various reflective delineation markers which were commercially available at that time. These reflective elements fall into three categories: (1) Flush mounted elements which are mounted on the pavement surface, (2) post-mounted units which are similar to our standard plastic circular type delineator, (3) a post-mounted reflective sheeting plaque which was reflective sheeting applied to an aluminum plaque.

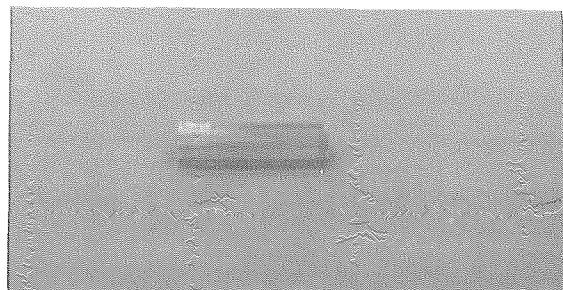
## LOCATION

The area selected for the field evaluation was M-39 (Southfield Freeway) from M-102 (Eight-Mile Road) to Van Born Road. This area provided some built in control, since ramp design and environmental conditions are similar. The area was experiencing some operational difficulties in the ramp areas. Good demarcation of these ramps was highly desirable.

## INSTALLATION AND DEVICES STUDIED

All post-mount elements were installed according to the Michigan Manual of Uniform Traffic Control Devices, and all flush mount units were installed according to manufacturers' specifications. The flush mount devices were installed as follows:

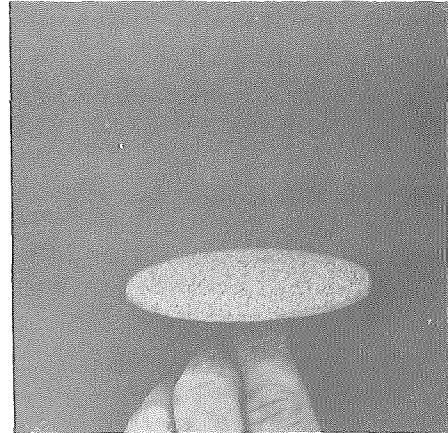
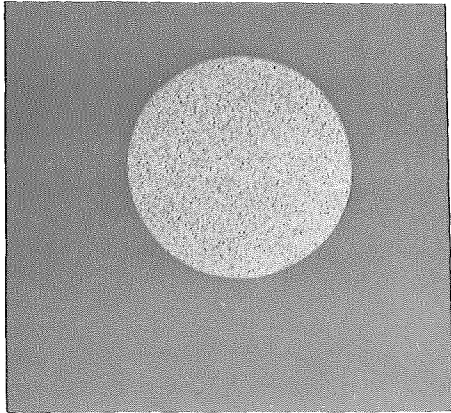
The 3M glass rods as shown in the photograph to the right.



This unit was installed at 5 foot spacing in four ramps.

1. M-39 Southbound Exit Ramp to Warren Avenue
2. M-39 Southbound Entrance Ramp from Outer Drive
3. M-39 Northbound Entrance Ramp from Van Born Road
4. M-39 Northbound Exit Ramp to Outer Drive

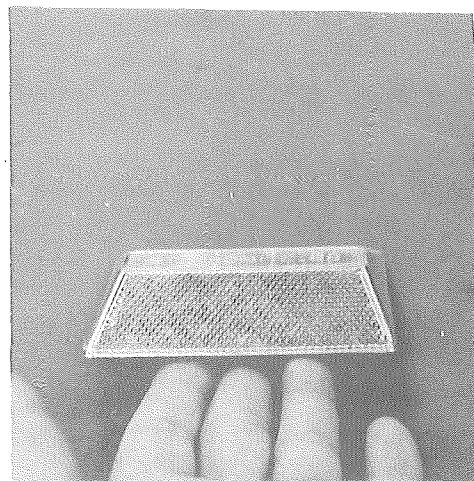
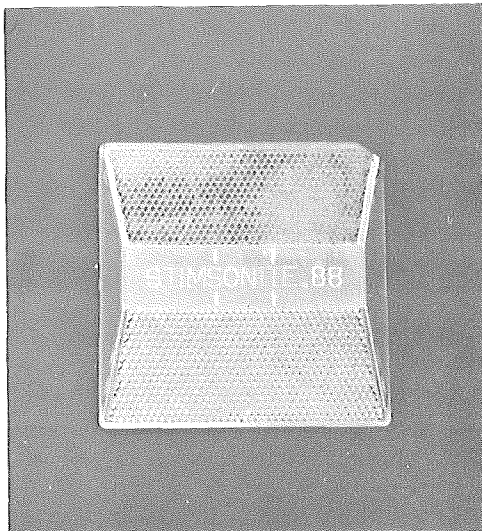
The Cataphote Corporation's Catadot as shown in the photographs below.



This element was installed at 50 foot spacing on four ramps.

1. M-39 Northbound Entrance Ramp from M-153 (Ford Road)
2. M-39 Northbound Exit Ramp to M-153 (Ford Road)
3. M-39 Southbound Entrance Ramp from Ford Road
4. M-39 Northbound Entrance Ramp from Rotunda Drive

The Stimsonite Corporation's Stimsonite 88 as shown in the photograph below.

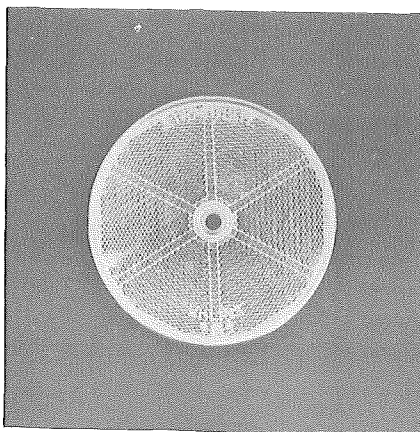


This element was installed at 50 foot spacing on four ramps.

1. Northbound Entrance Ramp from Warren Avenue
2. Northbound Exit Ramp to Warren Avenue
3. Southbound Entrance Ramp from Warren Avenue
4. Southbound Exit Ramp to Ford Road

The post mount devices were installed as follows.

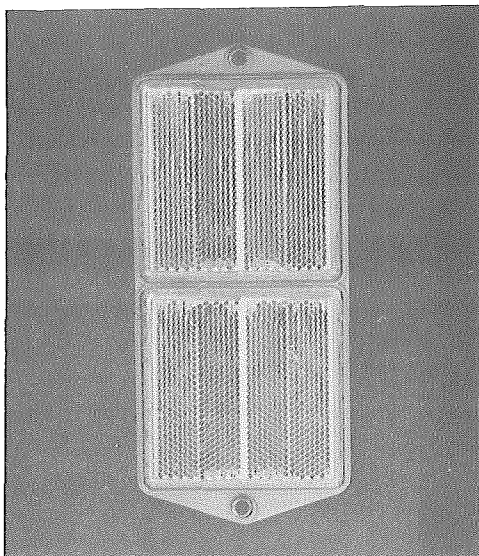
The 3M Corporation Scotch Guide button as shown in the photograph below.



This unit was installed at 50 foot spacing on five ramps.

1. M-39 Southbound Entrance Ramp from M-102 (Eight-Mile Road)
2. M-39 Northbound Exit Ramp to M-102 (Eight-Mile Road)
3. M-39 Southbound Entrance Ramp from Seven-Mile Road
4. M-39 Northbound Exit Ramp to Seven-Mile Road
5. M-39 Southbound Exit Ramp to Fullerton Avenue

The A.M.T. Corporation Prismatic delineator as shown in the photograph below.

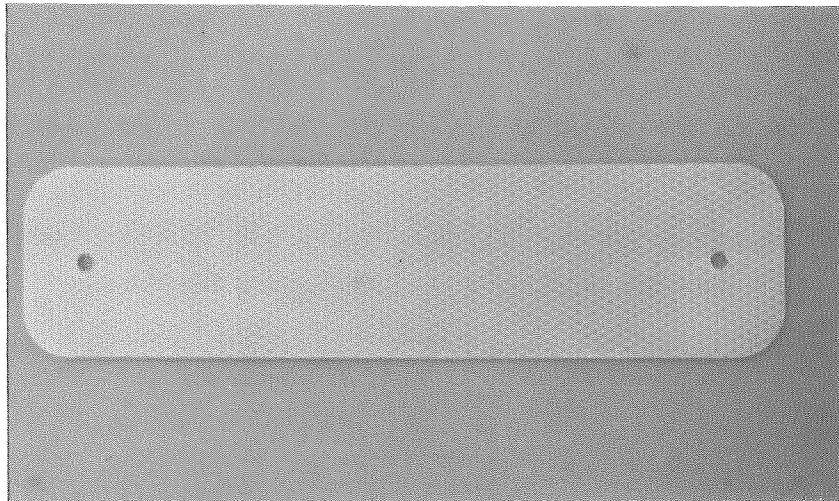


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This element was installed at 50 foot spacing on seven ramps.

1. M-39 Northbound Entrance Ramp from Six-Mile Road
2. M-39 Southbound Entrance Ramp from Six-Mile Road
3. M-39 Northbound Exit Ramp to Six-Mile Road
4. M-39 Northbound Entrance Ramp from Grand River Avenue
5. M-39 Southbound Exit Ramp to Grand River Avenue
6. M-39 Southbound Exit Ramp to Outer Drive
7. M-39 Northbound Entrance Ramp from Outer Drive

The 3M Corporation High Intensity Sheeting plaque as shown in photograph below.



This plaque was installed at 50 foot spacing on two ramps.

1. M-39 Southbound Entrance Ramp from Grand River Avenue
2. M-39 Northbound Exit Ramp from Grand River Avenue

#### METHOD EVALUATION

The evaluation of the devices tested was by visual inspection only. During each inspection a determination was made on the durability, condition and appearance of the units at each location. The visual inspections were made one month, six months, and one year after installation.

## VISUAL INSPECTION OBSERVATIONS

### ONE MONTH AFTER INSTALLATION

#### FLUSH MOUNTED DEVICES

At the ramps where Catadots were installed the spacing was too far apart for effective delineation of the ramp. At night the reflective return area to the driver was very small. This is likely to be due to the low profile spherical shape of the element. At the ramps where Stimsonite 88 units were installed the spacing was again too far apart for effective delineation. The reflective return of this element seemed adequate.

At the ramps with 3M glass rods the spacing was adequate even with the small reflective area of the rod, and the ramps were well delineated. It was noticed that in the mountable curb area several rods had been broken from being run over.

#### POST MOUNTED DEVICES

All the units appeared to delineate the ramps well and to have proper spacing. The A.M.T. prismatic elements appeared to have a lighter yellow color than the other delineators. The reflective sheeting units showed a slightly excessive dirt accumulation but no apparent effect on the reflective return of the element.

### SIX MONTHS AFTER INSTALLATION

The Catadots were of little value as a delineation device, some were gone completely, some were badly scarred from snowplow



operations, approximately 31 percent were missing. It was difficult to see the Catadots in the daylight and almost impossible at night.

Of the Stimsonite 88 units approximately 45 percent were missing or broken. All of these units had a large dirt accumulation. They gave very little reflective return at night and were inadequate as delineation devices.

Of the 3M glass rods about 50 percent were missing or broken. The dirt accumulation was heavy in front of the rods and had a large effect on the reflective return. At night the rods were inadequate as a delineation device.

#### POST MOUNTED DEVICES

At this time all elements appeared to delineate the roadway well. The normal urban dirt accumulation was present on all units without distinguishable difference in reflective return. An abnormal deterioration was discovered in the A.M.T. prismatic element. The bond between the plastic back and the plastic face had separated on approximately one-third of the units, and on some units the plastic back had broken away from the post completely.

#### ONE YEAR AFTER INSTALLATION

#### FLUSH MOUNTED DEVICES

None of the flush mount devices provide adequate delineation at this time. At only one ramp were any appreciable amounts of elements left. This was the northbound exit ramp to Warren

Avenue. Of the units installed at this ramp approximately 50 percent were missing, and the rest had a heavy amount of road dirt accumulation and provide almost no reflective return at night.

POST MOUNTED ELEMENTS

At this time the standard element and the 3M button appeared to delineate the roadway well. The A.M.T. elements had the back broken from the post or the reflective face gone on approximately 50 percent of the units installed. The 3M reflective sheeting plaques showed no deterioration of materials but had an unusually high dirt accumulation which had a large effect on the reflective return. The dirt film seemed to stick to the sheeting, and not be washed by normal rainfall. It was noticed that the dirt accumulation on the A.M.T. prismatic was somewhat less than any other unit.

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## CONCLUSIONS

The flush mounted elements tested are inadequate as a delineation device at this type of installation. The units have questionable durability and are susceptible to a high reflectivity loss from dirt accumulation.

Of the post-mounted elements tested, the Michigan Standard specification button and the 3M button were of equal value. They showed a high degree of reflective return, good durability and delineated the roadway well. The A.M.T. prismatic unit was not acceptable due to poor durability. The 3M reflective sheeting plaque was not acceptable due to large accumulations of dirt on the surface which affected its reflective return.

None of the devices tested show any advantage over present delineators being used at this type of installation.

From these conclusions the continued use of our present standard delineation device is recommended.

# FIELD EVALUATION OF REFLECTIVE DELINEATION MARKERS

## SYNOPSIS

This study was undertaken to perform a field evaluation of present and new reflective delineation markers commercially available.

The area selected was M-39 (Southfield Freeway) from M-102 (Eight-Mile Road to Van Born Road). The evaluation was made by periodic visual inspection with the following results found.

The flush mounted elements are inadequate as a delineation device at this type of installation. The units have questionable durability and are susceptible to a high reflectivity loss from dirt accumulation.

Of the post-mounted elements tested, the Michigan Standard specification button and the 3M button were of equal value. They showed a high degree of reflective return, good durability and delineated the roadway well. The A.M.T. prismatic unit was not acceptable due to poor durability. The 3M reflective sheeting plaque was not acceptable due to large accumulation of dirt on the surface which effected its reflective return.

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