

STATE OF CALIFORNIA
BUSINESS AND TRANSPORTATION AGENCY
DEPARTMENT OF PUBLIC WORKS

A
FACTFINDING STUDY ON THE EFFECTS
OF GROOVED AND TEXTURED PAVEMENTS
ON MOTORCYCLISTS

Assembly Concurrent Resolution No. 101
1972 Regular Session

March 1973

DEPARTMENT OF PUBLIC WORKS

1120 N STREET
SACRAMENTO, CALIFORNIA 95814



March 1, 1973

Honorable Darryl R. White
Secretary of the Senate
State Capitol

Honorable James D. Driscoll
Chief Clerk of the Assembly
State Capitol

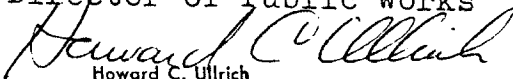
Gentlemen:

Assembly Concurrent Resolution No. 101 of the 1972 Regular Session by Assemblyman Eugene Chappie requested the Department of Public Works to conduct and submit, in conjunction with the Department of the California Highway Patrol and motorcycle riders, a study of the effects of serrations and pavement texture on motorcycles.

Attached are two copies of a report on the results of that study.

Sincerely,

JAMES A. MOE
Director of Public Works


Howard C. Ullrich
Chief Deputy Director

Attachments

*Assembly Concurrent Resolution No. 101—Relative to
the effect of highway surfaces on motorcycles.*

LEGISLATIVE COUNSEL'S DIGEST

ACR 101, Chappie. Highway surfaces.

Requests the Department of Public Works to conduct, in conjunction with the Department of the California Highway Patrol and motorcycle riders, a study of the effects of serration and texture of highway pavements on motorcycles, and to make a report thereon to the Legislature on or before March 1, 1973.

WHEREAS, Motorcyclists have reported that variations in the texture of the surface of highways have an effect on the handling of motorcycles; and

WHEREAS, The Department of Public Works uses rain-grooving and other techniques in highway construction to increase traction of motor vehicles in wet weather; and

WHEREAS, It is important to determine if such techniques constitute a hazard to motorcycles; now, therefore, be it

Resolved by the Assembly of the State of California, the Senate thereof concurring, That the Legislature hereby requests the Department of Public Works to conduct, in conjunction with the Department of the California Highway Patrol and motorcycle riders, a study of the effects of serration and texture of highway pavement on motorcycles, and to make a report thereon to the Legislature on or before March 1, 1973; and be it further

Resolved, That the Chief Clerk of the Assembly transmit copies of this resolution to the Director of Public Works and to the Commissioner of the California Highway Patrol.

CONTENTS

| | Page |
|--|------|
| Assembly Concurrent Resolution No. 101 | iii |
| Summary | v |
| Factfinding Study | 1 |

APPENDIX

Highway Research Report (Interim) "Effect of Broom Texture on Motorcycle Rideability", August 1972

REFERENCE

"A Study of the Effects of Grooving on Motor Vehicle Accidents", Department of Public Works, January 1972. (Response to House Resolution No. 126, 1971 Session)

SUMMARY

Motorcyclists find some sections of grooved and textured pavements uncomfortable riding. They insist that such pavements are hazardous and want advance warning signs and alternatives to grooving and textured pavements.

The Department of Public Works has conducted rideability studies and finds grooved and textured pavements can cause uncomfortable riding with some combinations of motorcycles and tires, but certainly not to the point of being hazardous.

Accident statistics support the rideability tests. The increase in motorcycle accidents on grooved sections has been 10% per 30-month study period, while motorcycle registrations statewide and motorcycle accidents on ungrooved freeways have increased an average 22% during corresponding study periods.

The Department of Public Works has undertaken research to find means of strengthening and lengthening the surface life of pavements and thus lessen the need for grooving and heavily textured pavements.

Warning signs are to be posted in advance of grooved sections that prove difficult to ride.

INTRODUCTION

Pursuant to Assembly Concurrent Resolution No. 101, a study was conducted to obtain opinions, suggestions, and guidelines for future action with regard to motorcycle rideability on State highways. An effort was made to obtain a broad base of opinion, and to this end the following groups were contacted:

1. Members of the California Motorcycle Industry Council at their annual meeting in Ontario, California.
2. Mr. Russ Sanford, representative for "Motorcycle Owners, Riders, Enthusiasts", and spokesman for "International Four Owners Association". The latter group has been very outspoken against grooving.
3. Private individuals and riders' representatives who have written letters of complaint.
4. The Commander, Safety Services, of the California Highway Patrol, who is cooperating in the joint study, and engineers of the CHP who have assisted in previous studies.

5. Members of the CHP motorcycle patrol in Sacramento County
(7 officers representing 40 years of riding experience).

RIDEABILITY STUDIES

The Department of Public Works and the California Highway Patrol have conducted rideability studies on previous occasions and they have indicated that grooving does not create hazardous conditions for motorcycles. The tests were objectively designed and based on the subjective opinion of professional riders. The findings of these studies were included in the Legislative Report "A Study of the Effects of Grooving on Motor Vehicle Accidents". (See Reference on page iv.)

In addition to the grooves which are cut into older pavement surfaces, there have been complaints by motorcyclists that the broomed texture which is applied to new pavements results in the same problem of rideability. The findings of a study on this were similar to those rideability studies on grooving; namely, there is some wiggle but not to the point of being hazardous.

An interim report "Effect of Broom Texture on Motorcycle Rideability" dated August 1972 is attached.

ACCIDENT STUDIES

Accident studies of California's initial grooving effort indicated that there was no significant change in motorcycle accidents after grooving. These studies were reported to the Legislature in

answer to House Resolution No. 126, in January 1972. The report is listed under "Reference" on page iv of this report.

A recent follow-up analysis of motorcycle accidents on grooved pavements confirm the earlier findings. There were 123 grooving projects on California highways (almost exclusively freeways) between mid-1966 and mid-1971. 113 of those projects involved grooving only and all lanes were grooved.

In the year prior to grooving there were 81 motorcycle accidents on these 113 sections. There were 90 motorcycle accidents in the year following the grooving, a 10% increase.

To account for the increase in motorcycle accidents during this period an analysis was made of motorcycle accidents on all California freeways that had not been grooved. It was found that motorcycle accidents on ungrooved freeways increased an average of 22% each period of time corresponding to the before and after study period of the grooved section. It was also found that motorcycle registration increased at the same rate.

In summary, while motorcycle registration and motorcycle accidents on ungrooved freeways increased at a rate of more than 20% per study period, the increase of motorcycle accidents on grooved sections increased only 10%.

MOTORCYCLISTS' VIEWS

Some motorcyclists still insist that grooved and heavily broomed pavements impart an unnerving and potentially dangerous "wobble", or side-to-side motion, to their cycles. They fear especially for inexperienced riders who may panic.

The heavy brooming on new concrete pavement is considered by most motorcyclists to be more severe in its effect than grooving for the first few months of service. The majority of opinion is that the "zig-zag" pattern of brooming and the lesser undulations of grooving contribute to the severity of the "wobbling". Tire width and tread pattern are also believed to have a significant effect. Riders and riders' groups recommend that the State test motorcycles with tires of various widths and tread patterns and widely publicize the results as a public service.

(It is suspected that narrow, straight-ribbed tires are much more susceptible than wide, random-patterned tires. The interim report in the appendix confirms the influence of tire and tread design and rider experience on broomed pavements.)

Leaving an ungrooved strip through grooved sections was rejected by motorcyclists' representatives. They felt there was no specific two feet of pavement that would be comfortable. In addition, confining oneself to such a strip would be very fatiguing to a rider.

The Department has undertaken a research project to develop new concrete finishing techniques to extend the skid-resistant life of portland cement concrete pavements. The study will include such innovations as seeding the fresh plastic surface with slag and other aggregates. Also, experiments will include placing grooves in the fresh concrete to preclude the future saw cutting of grooves.

It is felt that rideability testing of these new surfaces must include participation of riders' representatives. Motorcycles and riders should be selected by the CHP, the motorcycle industry, and rider's groups. The final evaluation, even though obtained by instrumentation, must be based upon a subjective scale, and public acceptance of test results would be greatly enhanced by public participation.

Oregon now uses a "Grooved Pavement" sign and a similar sign has been recommended to the Federal Highway Administration as a national standard. In the future, California will post warning signs ahead of those grooved sections that prove to cause an uneasy ride for motorcyclists.

Accident statistics will continue to be monitored in a continual measure of the effects of brooming and grooving on accidents.