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This study was conducted in cooperation with the U.S. Department of Transportation, Federal Highway Administration.

16. ABSTRACT

Performance evaluations were conducted of open-graded friction course sections constructed using conventional binders, rubber modified binders, and polymer modified binders. Visual inspections of the pavements 11 years after construction were inconclusive with regard to the superiority of any one type of binder as all were performing on an equal basis.

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# RUBBER-ASPHALT OPEN-GRADED FRICTION COURSE

I-5
Columbia River Bridge to 39TH Street

by
**Keith W. Anderson**
Research Specialist

**Final Report**
WA86-10

Prepared for
Washington State Department of Transportation
and in cooperation with
U.S. Department of Transportation
Federal Highway Administration

October 1997

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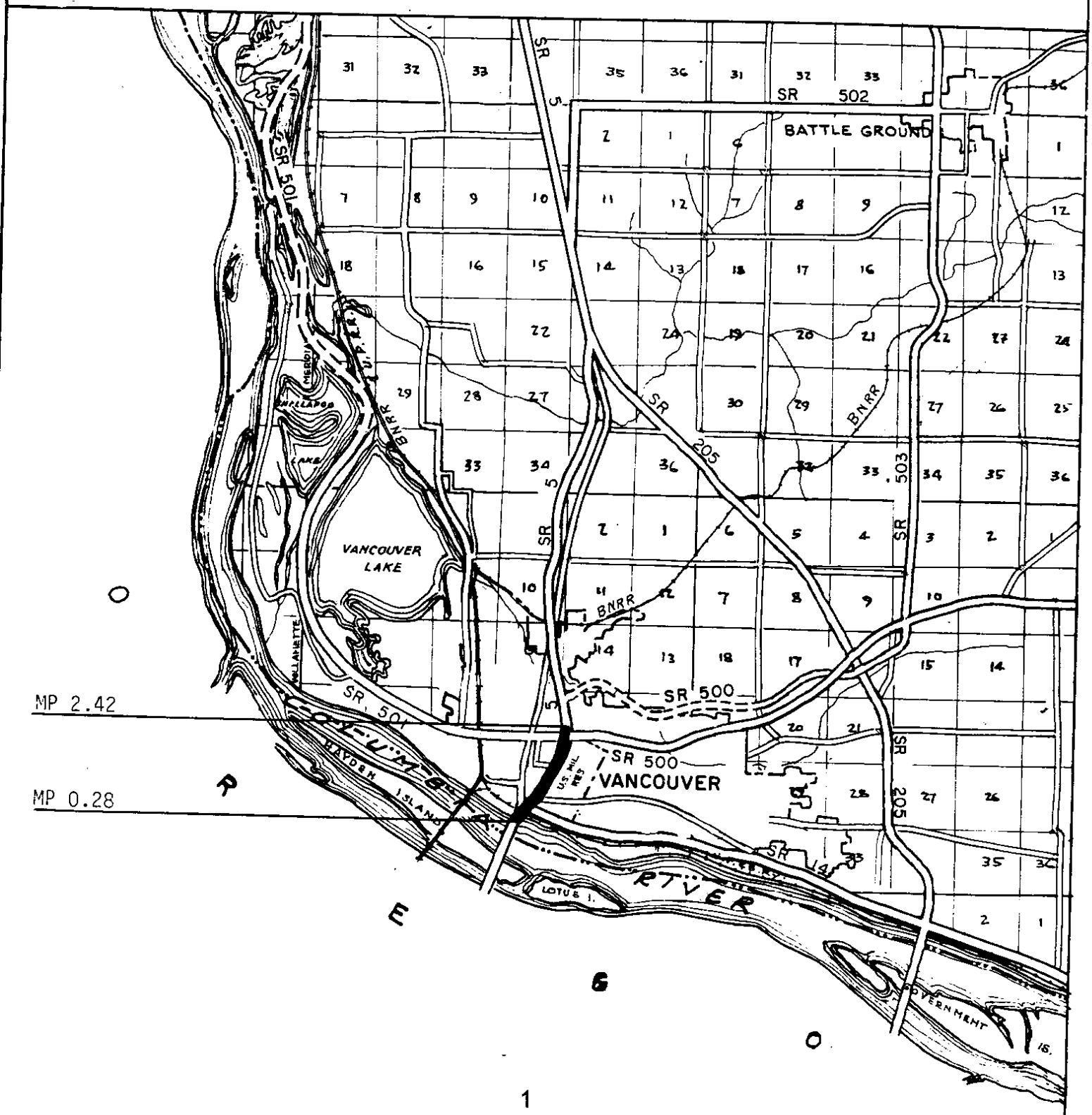
**WASHINGTON STATE DEPARTMENT OF TRANSPORTATION**

OLYMPIA, WASHINGTON

# MAP OF STATE HIGHWAYS

## CLARK COUNTY



## INTRODUCTION

This report describes the final evaluation of an experimental rubber-asphalt open-graded friction course overlay on I-5 in the Vancouver, Washington urban area. The rubber-asphalt overlay was selected over a conventional asphalt open-graded mix based on a desire to provide a longer lasting pavement. A 3000 foot long section of polymer modified asphalt open-graded pavement was added by change order during the construction of the project. Evaluations were conducted to measure the performance of both the rubber-asphalt and polymer-asphalt pavements against a control section of conventional open-graded pavement.

## STUDY SITE

The project began just north of the Columbia River Bridge which connects Portland, Oregon with Vancouver, Washington. It extended for approximately 1.2 miles north on Interstate 5 as shown on the vicinity map. The pertinent facts concerning the construction contract are tabulated below:

Contract Number: 3044
Contract Name: Columbia River Bridge to 39th Street
Route Number: I-5
Milepost Limits: 0.28 to 2.42
Number of Lanes: 6 plus on-off collectors and ramps
Overlay Thickness: 0.06 feet (3/4 inch)
Project Engineer: Bill Pierce
Contractor: Cascade Construction Co., Portland, OR
Completion of Paving: July 25, 1986

A schematic drawing of the location of the various pavement types is shown in Figure 1. It should be noted that an added variable was introduced into the experiment with the addition of a fog seal on certain portions of the project.

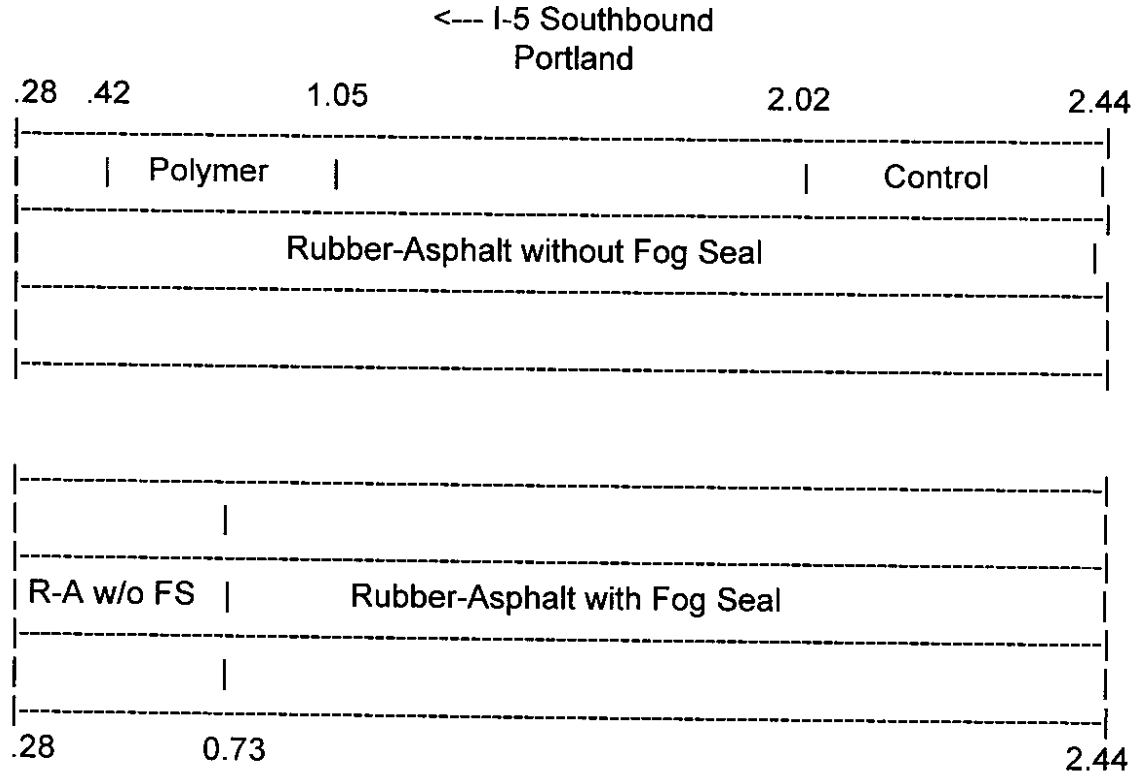



**Figure 1. Location of pavement sections.**

## PERFORMANCE EVALUATION

The final evaluation of performance took place just a month and a half short of 11 years of service for this project completed in July of 1986. The center lane of the three lanes was the first to show signs of distress in the form of rutting/wear. This was true in both directions with the northbound showing the wear first. The next lanes to show wear were the inside lanes in both directions with the northbound again leading the way.

It became apparent during the course of the evaluations that there was very little traffic in the outside lane southbound. This lane contains both the control section of conventional asphalt and the section of polymer-asphalt pavement, as well as a section of the rubber-asphalt pavement. It was, therefore, the focal point for the comparison of the three pavements. Visual inspection of the traffic patterns indicates that this lane serves as a collector/distributor for the many on-off ramps throughout this stretch of Interstate 5. It was assumed that the traffic volumes are similar for the length of the project in this lane.

At the last visual inspection all three of the sections had virtually identical amounts of distress in the form of moderate raveling/rutting. The only real difference was some very minor flushing in the polymer-asphalt section which was present from the very beginning of evaluations. In fact, if anything, the control section of conventional asphalt open-graded mix had the best appearance due to the absence of the flushing found in the polymer section.

## CONCLUSIONS

The vastly differing amounts of traffic on each of the lanes had a detrimental effect on this experiment. The placement of the control section and the polymer-asphalt section in the outside lane southbound turned out to be the poorest choice from an experimental design standpoint. The center lane in either direction would have been the best place to evaluate performance on a side by side comparison. No real conclusions can be drawn, since all three sections in this southbound lane with assumed equivalent traffic volumes, are still performing in an equal manner. It was hoped that these three sections in the southbound lane could be evaluated until failure occurred, however this project is scheduled for an overlay this

construction season. This, therefore, was the last chance to evaluate the performance of these three open-graded pavements.