



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ryan W. McMorrow</b>	<b>Project Number</b> <b>J0223</b>
<b>Project Title</b> <b>Rubber Meets the Road</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Rubberized asphalt is supposed to reduce noise levels as well as help the environment by using recycled tires as eighteen percent of the asphalt mixture. The purpose of this experiment is to see if rubberized asphalt reduces noise volumes for communities neighboring major freeways.</p> <p><b>Methods/Materials</b> A sealed box was constructed to model the absorption level of each surface and to discover which surface reduced noise most. Four different surfaces were tested; one with wood; one with non-rubberized asphalt; another with 18% rubberized asphalt; and the last with 36% rubberized asphalt. The 18% rubberized asphalt represented as close as possible the real rubberized asphalt used by Caltrans. All the variables were controlled so they could not effect testing. In addition to the model, two places were picked along freeway 280 to determine if my results accurately corresponded with sound along the freeway; one test site which used regular asphalt and the other rubberized asphalt. The noise level was measured in two ways, the first in the car while driving over each surface, and second readings were taken at 30, 40, and 60 feet from the freeway.</p> <p><b>Results</b> The rubberized asphalt surfaces reduced noise levels sufficiently in the small space for testing because of the rubbers' ability to absorb noise. The wood absorbed very little sound, but more than the non-rubberized asphalt.</p> <p><b>Conclusions/Discussion</b> The rubber reduced the noise levels by absorbing sound. Rubber absorbs sound because soft materials like rubber absorb sound by allowing the sound's pressure changes to use their energy bending the materials. After all the energy is taken out of a sound wave there is no longer enough energy to shift the molecules of the medium it is traveling through. Rubber does not take all the energy from sound waves, but can take a great deal of it. My conclusion is that rubberized asphalt reduces noise levels and also helps the environment. Because of its ability to absorb noise, rubberized asphalt can reduce noise levels from cars by 2-5 decibels which will help communities near freeways a lot.</p>	
<b>Summary Statement</b> Testing the benefits in noise reduction of rubberized asphalt	
<b>Help Received</b> Mother helped glue down backings on the display board. My father drove me to the freeway test sites and also helped cut the wood.	