

# FY 2009 RESEARCH PROBLEM STATEMENT

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### TITLE

Determination of Statewide Roughness Coefficient Equations for Mountainous Streams in Oregon.

### PROBLEM (Description of need)

Most hydraulic calculations of flow in channel and over bank areas require an evaluation of flow resistance, generally expressed as Manning's roughness coefficient  $n$ . Hydraulic calculations are used to determine the size of highway crossing structures. The degree of roughness depends on many factors. For higher gradient streams roughness coefficients are difficult to determine because of extreme turbulence and large energy losses. Current verified  $n$  information in mountainous Oregon streams is very lacking.

### PROPOSED RESEARCH, DEVELOPMENT OR TECHNOLOGY TRANSFER ACTIVITY

Existing roughness coefficient information from the FHWA, USGS and ODOT for mountainous areas of Oregon will be compiled. Using hydraulic characteristics of those streams the  $n$  values can be separated into regression equations for several regions of the state. Then these  $n$  value prediction equations can be used to provide a more reproducible method and to better understand in the calculation of roughness coefficients.

### BENEFITS

By better understanding the roughness coefficients in mountainous areas of Oregon, more accurate design of bridge structures can be achieved. More uniform determination of the coefficients will allow for more consistent design of road crossing structures.

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