**Title:** Surface-water Model System License Renewal Agreement

**Sponsoring** Federal Highway Administration

**Agency:**

**Lead Agency** Federal Highway Administration

**Contact:**

**FHWA Technical** Larry Arneson (larry.arneson@dot.gov)
**Liason :**

**Phone:** 720-963-3200 **Fax:** 720-963-3232

**Background:**

The Surface-water Model System (SMS) is a graphical user interface (GUI) for FHWA’s FST2DH finite element two-dimensional depth averaged surface-water program used to model water surface elevations and velocities in floodplains, at highway crossings, and at structures (bridges, culverts, weirs, and bridge piers). SMS and FST2DH are used to model flows in riverine and tidal environments. The program is a graphical user interface (GUI) used to construct, edit, and display finite element networks used in hydraulic modeling, and to view the results. As such, SMS is considered a pre- and post-processor for two-dimensional hydraulic models.

SMS is a GUI for a number of advanced hydraulic models. It allows for the efficient and accurate creation of finite element networks and data files associated with the hydraulic models it supports. It also readily helps the user visualize the results in a number of easily understandable formats such as contours of water surface elevation, velocity, and many other important hydraulic outputs.

SMS supports a number of hydraulic models such as FST2DH, TUFLOW, RMA-2, and a number of models more specific to the coastal environment. These models can perform both steady (riverine) and unsteady (hydrograph and coastal) flow modeling to provide hydraulic analyses of highway crossings and structures.

Computation of two-dimensional depths and flow velocities allow for better representations of flow patterns through and around structures over the results that are generated from one-dimensional hydraulic models. For this reason, SMS and FST2DH are used by FHWA and many state DOTs to perform the hydraulic analysis of complicated or unusual hydraulic structures or environments so that the results can be visualized in a robust and easily understood manner.

In the past FHWA has been the sole source of funds to pay for the license agreement with the program developer Aquaveo, LLC. The current licensing agreement provides full access to the hydraulic modeling capabilities required by most State Departments of Transportation. Equivalent licenses obtained individually would cost more than $7500 per user.

**Objective:**

The objective of these pooled funds is to re-new the SMS license agreement for another five years and continue to provide licenses of the software to all Federal and State Department of Transportation employees.

**Comments:**

Suggested contribution: **$10,000**

The Federal Highway Administration will serve as the coordinator for this pooled-fund project. State DOT's will be solicited for their interest and participation in renewing the free SMS license to State DOT employees.

Person Developing the Problem Statement

Larry Arneson, PhD, P.E., D.WRE
Principal Hydraulic Engineer
Federal Highway Administration, Resource Center
12300 West Dakota Avenue
Lakewood, CO 80228
larry.arneson@dot.gov