Real-time contaminant sensing and control in civil infrastructure systems[1] SARA RIMER, NIKOLAOS KATOPODES, Univ of Michigan - Ann Arbor — A laboratory-scale prototype has been designed and implemented to test the feasibility of real-time contaminant sensing and control in civil infrastructure systems. A blower wind tunnel is the basis of the prototype design, with propylene glycol smoke as the "contaminant." A camera sensor and compressed-air vacuum nozzle system is set up at the test section portion of the prototype to visually sense and then control the contaminant; a real-time controller is programmed to read in data from the camera sensor and administer pressure to regulators controlling the compressed air operating the vacuum nozzles. A computational fluid dynamics model is being integrated in with this prototype to inform the correct pressure to supply to the regulators in order to optimally control the contaminant's removal from the prototype. The performance of the prototype has been evaluated against the computational fluid dynamics model and is discussed in this presentation. Furthermore, the initial performance of the sensor-control system implemented in the test section of the prototype is discussed.

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