In this talk, we examine optimal control problems for mass-conserved network dynamics. We will review previous work on optimal data exchange, where we control the boundary transport of data densities between two domains, and on repairable systems, where we optimize a time-dependent repair schedule to maximize system availability. We will also model flows on general networks, formulating the dynamics as a system of hyperbolic PDEs on a graph. Using this general framework, we propose to use the model to formulate new methods for network optimization and feedback control.