

# A STRUCTURAL PERFORMANCE

FINITE ELEMENT MODELING is a long-established method for determining the structural performance and load-bearing capacity of a wide variety of steel-framed structures, including truss systems. 2D and 3D diagrams and models take into account the direction and magnitude of tensile and compressive forces. Often, tension and compression are illustrated in blue and red, respectively, while structurally neutral elements are rendered in green. In more complex, multi-span assemblies, forces can vary along the structural members.

## GOALS:

1. Honor the history of the current structure as an engineering landmark.
2. Create an illuminated (evening) destination on the Fort Point Channel.

Here at a key gateway to Boston's Innovation District, I propose  
A PERFORMANCE-ART INSTALLATION DESIGNED TO ILLUMINATE – LITERALLY AND FIGURATIVELY –  
FUNDAMENTAL STRUCTURAL ENGINEERING PRINCIPLES: linear LED lighting placed along the  
reconstructed Northern Avenue Bridge members to illustrate the axial forces of tension and  
compression acting on the principal truss components when the structure is open (i.e., cantilevered)  
and closed (i.e., simple span). Coordinated by computer software, the light fixture array could simulate  
the actual forces acting on the various components, but an ideal scenario would involve remote sensors  
displaying the actual forces obtaining from the bridge sections and the activities occurring within them.  
If the bridge can be reconstructed to swivel open and shut similar to the original operation, the  
coordinated LED lighting can also display and interpret the additional torsional and/or lateral forces  
acting on the center span as the rotation sequence begins and ends.

*Note: The graphic simulation below is intended to illustrate an interpretive, educational concept; it is  
NOT an accurate finite element model!*

