

M5 Statically Determinate Systems

Can determine force distribution by solely applying equations of equilibrium

Return to flagpole example (Planar system)

Which is a planar system, but we can again generalize to 3-D



3 reactions, 3 degrees of freedom, therefore the problem is statically determinate

Apply horizontal equilibrium of forces: $\sum F_x = 0: H_A = 0$

↑
 No applied
 forces

Vertical equilibrium of forces

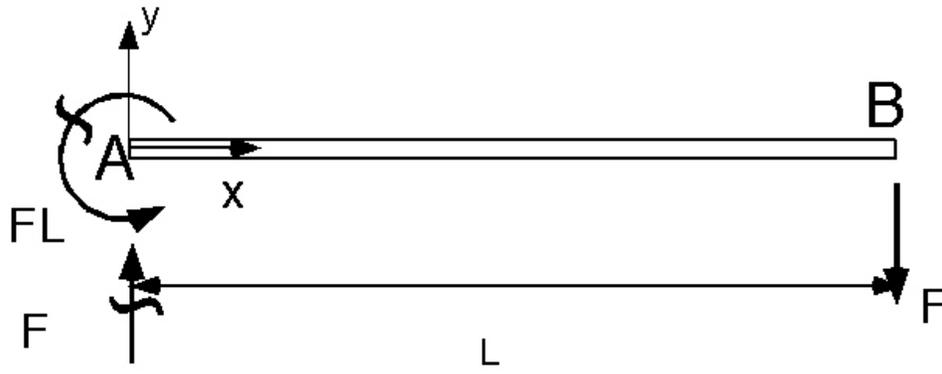
$$\sum F_y = 0: V_A - F = 0: V_A = F$$

Finally equilibrium of moments:

$$\sum M_A = 0: M_A - LF = 0: M_A = +LF$$

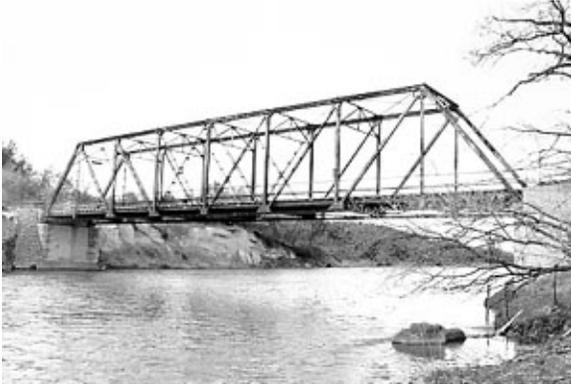
All reactions determined

Redraw FBD using results



Trusses

A truss is a structural configuration consisting of bars connected at joints. Generally 3-D - (a.k.a. space frames), We will concentrate on 2-D cases. Truss structures have practical uses and will also serve as an introduction to the techniques of structural analysis.



Images courtesy of U.S. Dept. of Transportation.