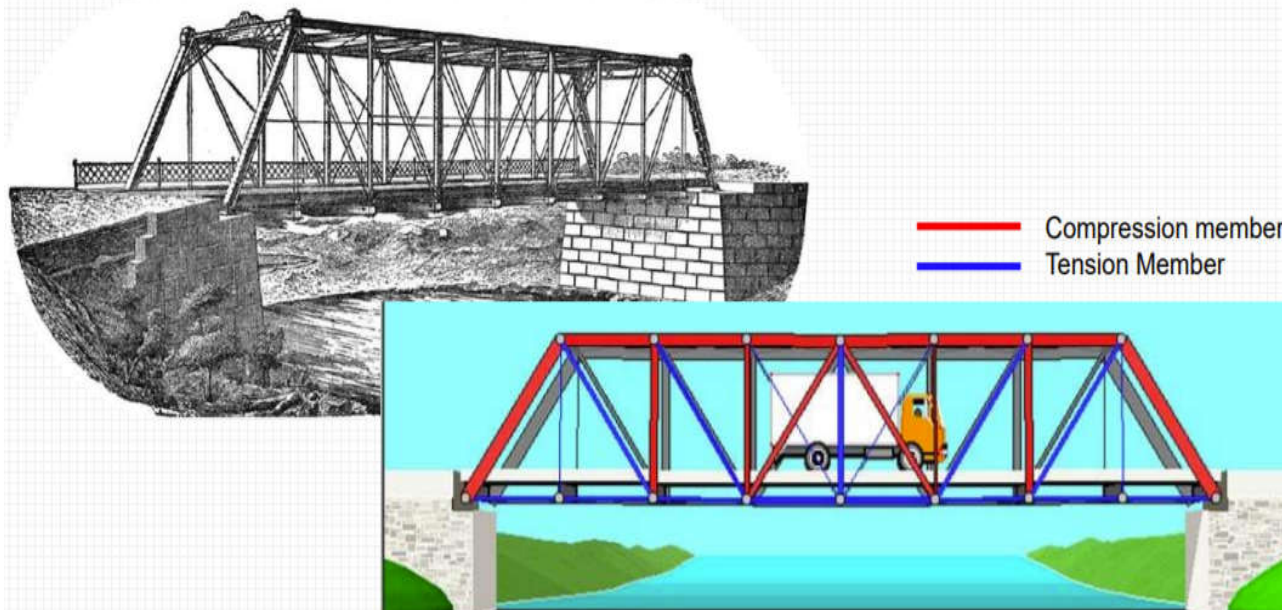


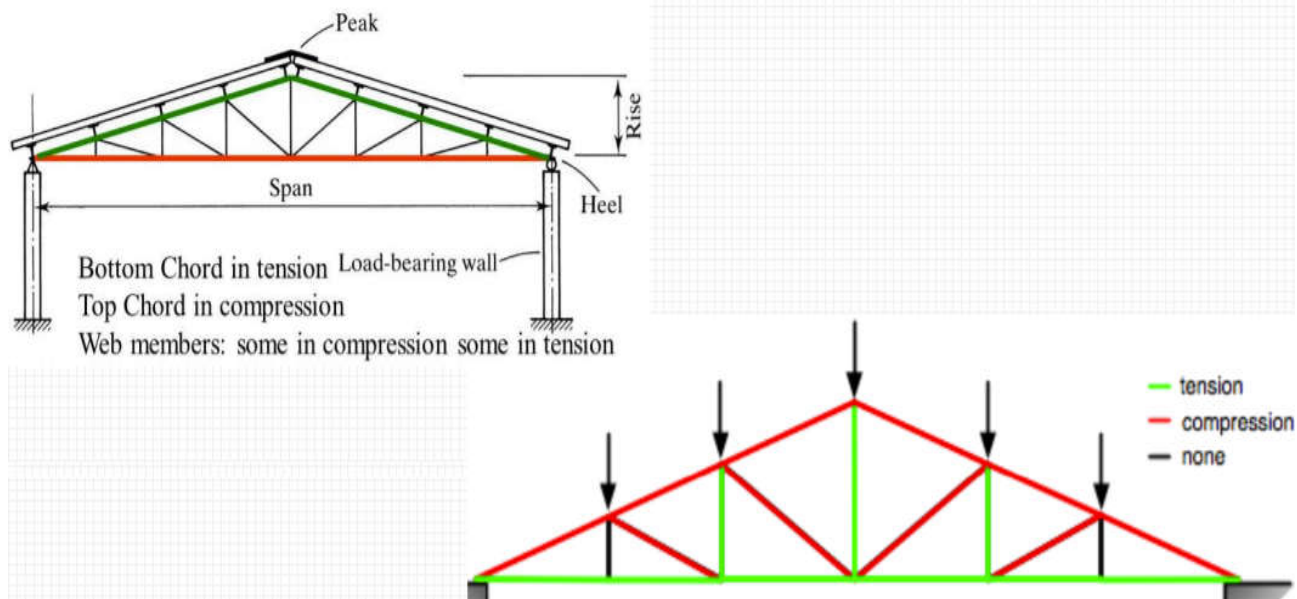


Compression Members

Compression members in bridges:

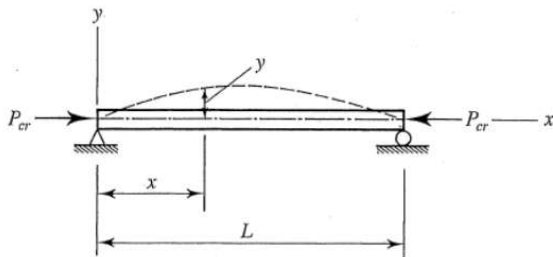


Compression members in trusses:





Euler Column Buckling (1757)



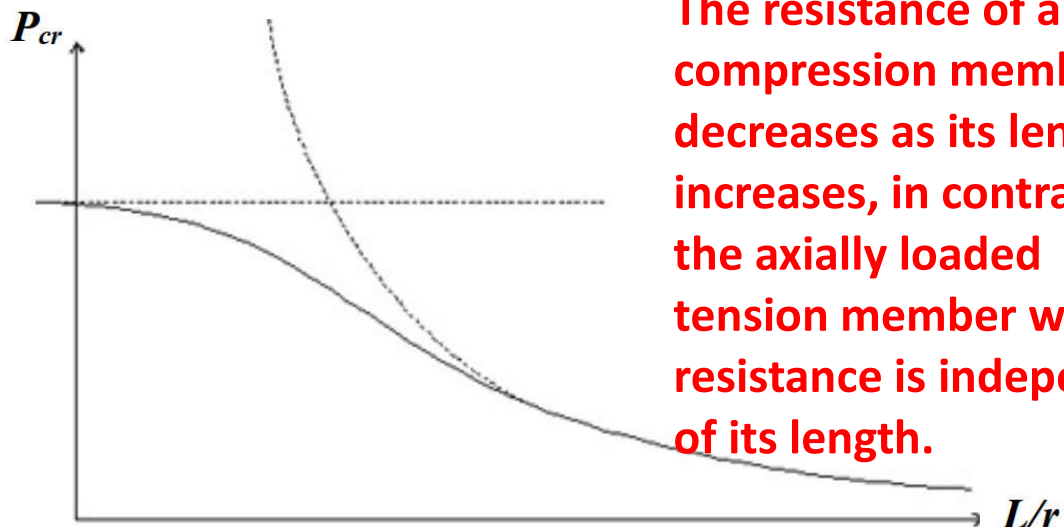
$$y'' + \frac{P_E}{EI} y = 0$$

$$P_E = \frac{\pi^2 EI}{L^2} \quad y = B \sin\left(\frac{\pi x}{L}\right)$$



Leonhard Euler (1708-1783)

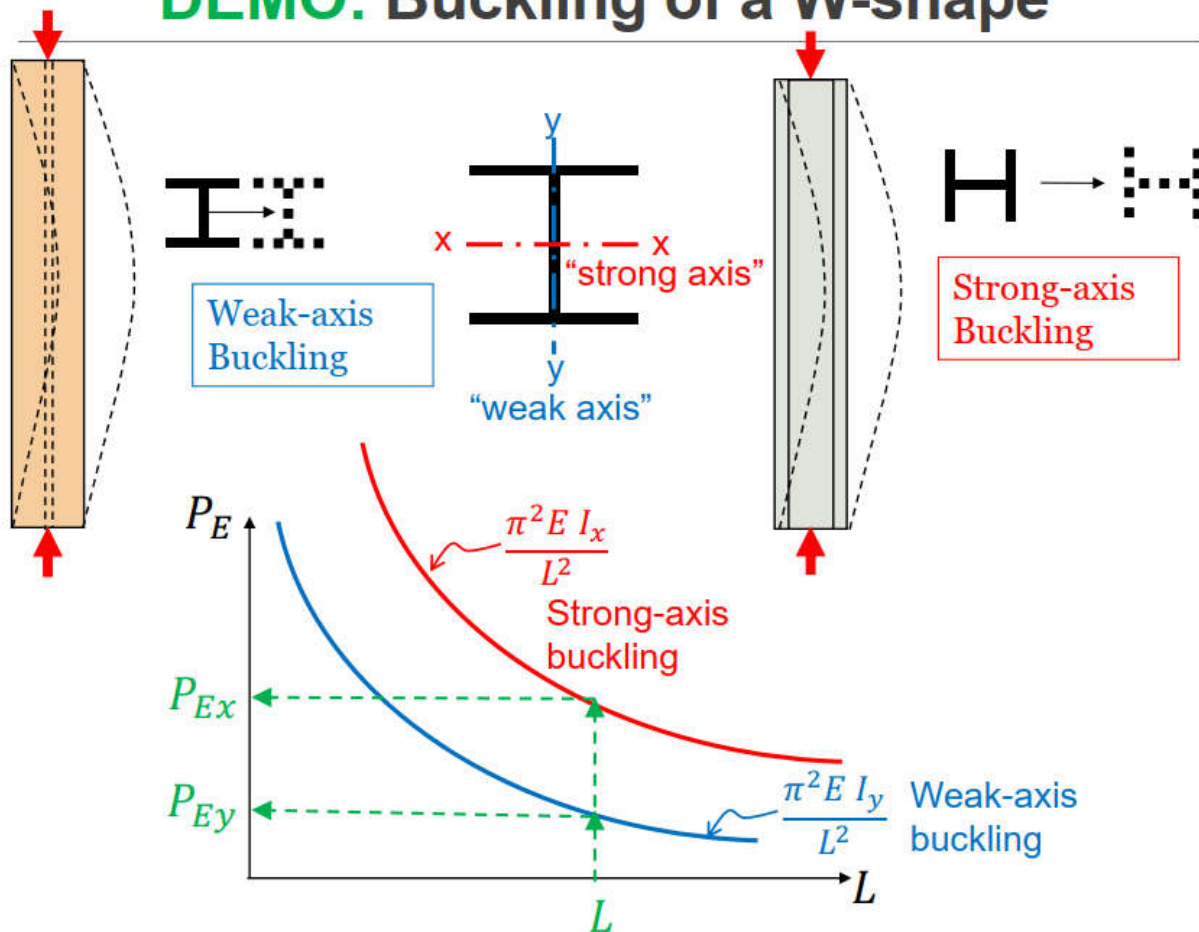
Column Strength (graph is for a constant value of A_g)



The resistance of a compression member decreases as its length increases, in contrast to the axially loaded tension member whose resistance is independent of its length.



DEMO: Buckling of a W-shape





Effective Length, KL

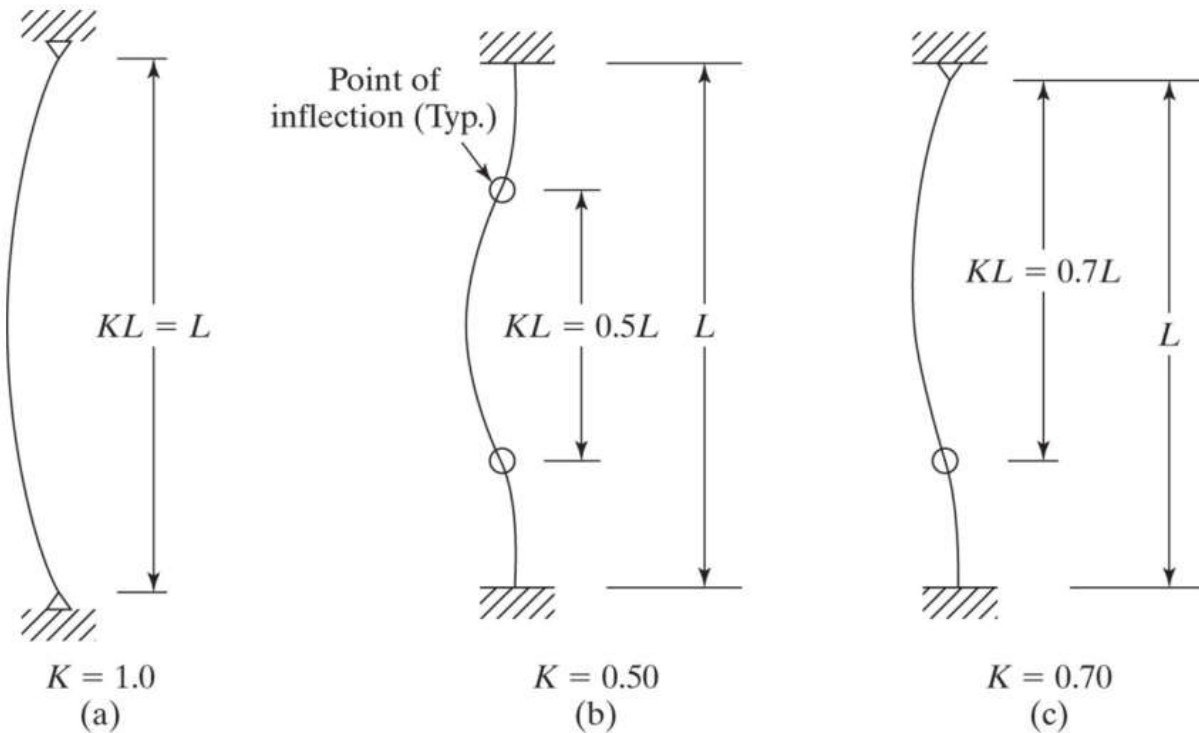


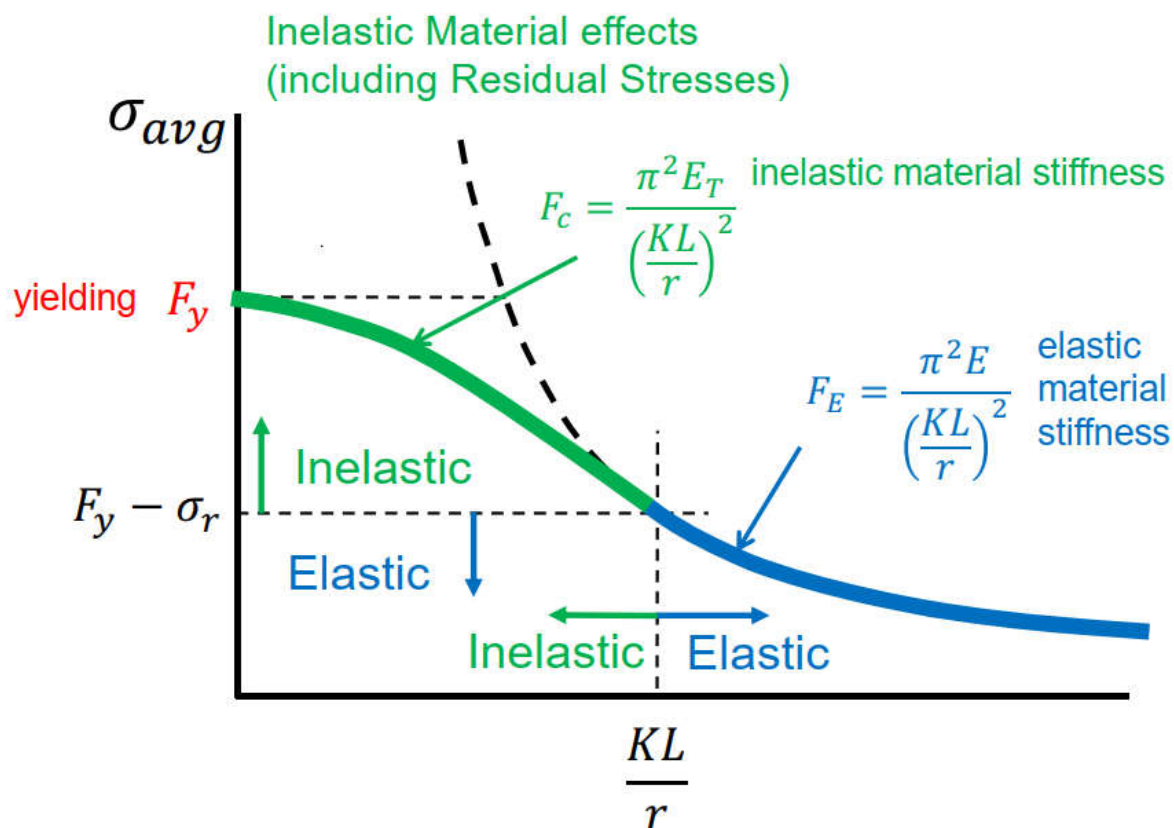


TABLE C-C2.2
Approximate Values of Effective Length Factor, K

Buckled shape of column is shown by dashed line.	(a)	(b)	(c)	(d)	(e)	(f)
Theoretical K value	0.5	0.7	1.0	1.0	2.0	2.0
Recommended design value when ideal conditions are approximated	0.65	0.80	1.2	1.0	2.10	2.0
End condition code	<p> <i>Rotation fixed and translation fixed</i> <i>Rotation free and translation fixed</i> <i>Rotation fixed and translation free</i> <i>Rotation free and translation free</i> </p>					



Buckling curve regions





AISC, Chapter E

