Fairness LP Model

*Parameters:*

*A = set of arcs*

*N = set of nodes*

*= maximum capacity of each arc,*

*= maximum demand of each node,*

*= set of nodes in group j*

*Variables:*

*=flow on arc a,*

*=demand satisfied at node i,*

*a = minimum percentage of demand that each group received*

*Linear Program:*

*s.t*

Alternative Fairness LP

*Parameters:*

*A = set of arcs*

*N = set of nodes*

*= maximum capacity of each arc,*

*= maximum demand of each node,*

*= set of nodes in group j*

*Variables:*

*=flow on arc a,*

*=demand satisfied at node i,*

*= average proportion of power per group*

*Linear Program:*

*s.t*

Integer Linear Model to Increase Network Capacity

*Parameters:*

*A = set of arcs*

*N = set of nodes*

*= maximum capacity of each arc,*

*= maximum demand of each node,*

*t = maximum number of hours spent on installing bolts*

*Variables:*

*=flow on arc a,*

*=demand satisfied at node i,*

*= number of bolts added to arc a,*

*Linear Program:*

*s.t*