

• VOLUME BOUNDS for each SEGMENT:

$$\rightarrow \text{Front: } [25, 15, 13, 20, 16, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0] [x] \leq 200$$

$$\rightarrow \text{Middle: } [0, 0, 0, 0, 0, 25, 15, 13, 20, 16, 0, 0, 0, 0, 0] [x] \leq 500$$

$$\rightarrow \text{Back: } [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 25, 15, 13, 20, 16] [x] \leq 300$$

• $\left[(\text{mass}_{\text{front}} + \text{mass}_{\text{back}}) \leq (\text{mass}_{\text{middle}}) \right] :$

$$\left[500, 1500, 2100, 600, 400, 0, 0, 0, 0, 0, 500, 1500, 2100, 600, 400 \right] [x] \leq \left[0, 0, 0, 0, 0, 500, 1500, 2100, 600, 400, 0, 0, 0, 0, 0 \right] [x]$$

$$\rightarrow \left[500, 1500, 2100, 600, 400, -500, -1500, -2100, -600, -400, 500, 1500, 2100, 600, 400 \right] [x] \leq 0$$

• $\left[(\text{mass}_{\text{middle}}) \leq 2 \times (\text{mass}_{\text{front}} + \text{mass}_{\text{back}}) \right] :$

$$\left[0, 500, 1500, 2100, 600, 400, 0, 500, 1500, 2100, 600, 400, 0, 500, 1500, 2100, 600, 400 \right] [x] \leq 2 \left[500, 1500, 2100, 600, 400, 0, 0, 0, 0, 0, 500, 1500, 2100, 600, 400 \right] [x]$$

$$= \left[0, 500, 1500, 2100, 600, 400, 0, 500, 1500, 2100, 600, 400, 0, 500, 1500, 2100, 600, 400 \right] [x] \leq \left[1000, 3000, 4200, 1200, 800, 0, 500, 1500, 2100, 600, 400, 1000, 3000, 4200, 1200, 800 \right] [x]$$

$$= \left[-1000, -3000, -4200, -1200, -800, 500, 1500, 2100, 600, 400, -1000, -3000, -4200, -1200, -800 \right] [x] \leq 0$$