The Concrete Mixer Challenge - SOLUTION

Step 1: Total trips required

Alex's **Mack Granite CV713 Cement Mixer** carries **9 cubic yards** of concrete per load. He needs to transport **270 cubic yards** in total.
Total trips needed: **270 ÷ 9 = 30 trips**

Step 2: Round-trip travel time

Each trip involves:

- **12 miles one way → 24 miles round trip**
- **Truck speed = 40 mph**
- **Loading time = 5 minutes**
- **Unloading time = 8 minutes**

Driving time per round trip:

24 ÷ 40 = 0.6 hours (**36 minutes**)

Total time per trip:

36 minutes (driving) + 5 minutes (loading) + 8 minutes (unloading) = 49 minutes

Step 3: Total work time required

With **30 trips**, total required time is: **30 × 49 minutes = 1,470 minutes** (**24.5 hours**)

Step 4: Can Alex finish within 7 hours?

Since 7 hours = **420 minutes**, and Alex needs **1,470 minutes**, **he cannot complete all deliveries alone within the shift**.

Step 5: Impact of unexpected traffic (adding 15 minutes per trip)

If traffic delays each trip by **15 minutes**, total delay time across 30 trips: **30 × 15 = 450 minutes** (**7.5 hours extra!**)

Alex now needs: **24.5 hours + 7.5 hours = 32 hours**, which makes the deadline **even more impossible without assistance**.

Final Conclusion

Alex will **NEED additional concrete mixers or faster delivery** to complete the job before finishing crews start work. Without help, he'll **fall far short of the 7-hour deadline**!