BOTEC = Back of the envelop calculation 1

Estimating cars on IH10 at DeZavala during a typical lunch hour (noon to 1 pm).

Last time class estimates ranged from 19 to 9000 vehicles:

**Assumptions:**

- Car length: 15 feet on average
- feet/mile: 5280
- Average speed of a car: 60 miles/hour
- Lanes at IH10: 6 lanes (3 in each direction).

**Feet of highway to work with:**

\[ 60 \text{ miles/hour} \times 1 \text{ hour} \times 5000 \text{ feet/mile} \times 6 \text{ lanes/highway} = 1.8 \times 10^6 \text{ feet/highway} \]

**Upper bound** [short cars --- bumper to bumper --- 10 feet/car]:

\[
\frac{1.8 \times 10^6 \text{ feet/highway}}{10 \text{ feet/car}} = 1.8 \times 10^5 = 180,000 \text{ cars/highway}
\]

**Lower bound:** [cars --- spaced far apart -- 1000 feet/car]:

\[
\frac{1.8 \times 10^6 \text{ feet/highway}}{1000 \text{ feet/car}} = 1.8 \times 10^3 = 1800 \text{ cars/highway}
\]