Model Challenge: Car Response Model

Idea: Develop a model for the driver of a car following a second car. Since a car's speed is controlled only by the accelerator and brake (de-accelerator), you'll only be able to control the speed by changing the value of the 2nd derivative.
Details: Let $x(t)$ be the position of the front of your car. Let $C(t)$ be the position of the front of the lead car. Your model will describe $x''(t)$ in terms of the following quantities:

- L - the length of the lead car
- $d = C(t) - L - x(t)$ - the distance between the cars
- $dd = C'(t) - x'(t)$ - how fast the distance between the cars is changing
- Braking = if $C''(t) < 0$ - if the lead car is braking
- $s = x'(t)$ - your present speed
- SL - the speed limit

All units will be in feet and seconds.

The final result should be a function which takes values for L, d, dd, Braking, s, and SL and produces a value for the acceleration $x''(t)$ (in ft/sec^2). You should design your function to mimic a typical driver as best as possible. Your function could be fairly complicated by involving various cases; it's your choice. The final result should be something that we can write a program to evaluate; so it must be logically structured. We'll program these models and do a comparison to see which seems the most realistic.
More Information/Helps: To get started, think about some simple cases, like: following a constant speed car, following an accelerating car (like from a light), and following a stopping car. Then you might consider some more extreme cases, like following a car that is miles ahead of you or following a car whose speed is oscillating. It might help to think about some values that help you judge what to do, like: want to use:

- `ESL` - the effective speed limit for your driver; it might be `SL` or `1.5 SL` depending on the driver.
- `maxA` - the maximum acceleration for the car; for 0-60mph in 6 s, we get an acceleration of 10 f/s^2; without flooring it, you get around 4 f/s^2.
- `Br` - the braking de-acceleration; stopping in 155 f from 60 mph gives an acceleration value of -25 f/s^2.
- `minD` - the minimum distance between the cars; it is usually proportional to your speed (2 second rule implies `minD = 2 s`)

You may want to include checks to see if you exceed any of these limits.

```
function accel = mycar(L,d,dd,Braking,s,SL)
% a function to model the acceleration of a car under various
% circumstances

ESL =
maxA =
Br =
minD =
















accel =
```