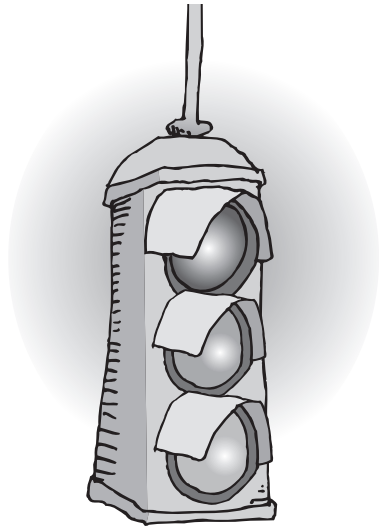


# Is That Ticket Fair?: Social Justice at the Stoplight

**Level and Subject:** High school algebra II or higher, physics

## The Hook

Have you ever been on the receiving end of a red light ticket that you perhaps deserved but didn't think



was quite fair? You're still going to have to pay the fine after this investigation, but you might have a few interesting things to share with the judge. It turns out that not all intersections with lights are created equal. To determine the level of "unfairness" the student investigators take a look at

both linear and quadratic equations and lines.

## Investigation

The basic idea is to gather data about the various stoplights you wish to analyze, calculate what I call "safe-to-run" (linear equations) and "safe-to-brake" (quadratic equations) distances, and determine if there exists a distance from which you can neither safely run the light nor stop in time.

Several pieces of information are required to make this calculation:

1. Reaction time (consider: age, impairment, driving

conditions, passengers)

2. Braking distance (consider: speed, road conditions, weather, tires, car model)
3. Physical information about the intersection in question (consider: width of intersection, length of yellow light, turning distances).

## Your Task

Students choose a stoplight(s) in town from which to collect data and then investigate and determine whether or not there exists an unsafe zone for any and/or all types of cars, where the car can neither slow down in time nor make it through the light without running it red.

For a detailed description of this investigation, as well as examples and templates, go to <http://starship-gaia.net/BobGeorge>.

## Things to Come

- Basketball and the Binomial Theorem
- Benchmark Quest
- Bridges of Oregon
- The Cost of Credit Card Procrastination
- Design a Car for Your Child or Grandchild
- Homemade Fruit and Vegetable Batteries
- Jettison Junk Mail, Save a Forest
- The Lima Bean Lottery, and Other Lotteries
- Model the Motions of the Planets
- Outfitting for Time Machine Travel to Beringia
- People's Energy Company
- Surfboards, Snowboards, and Algebra
- The Cost of Bottled Water: Dollars, Environment
- Your Personal Energy Machine 