

**Team Number:** SVAHS175

**School:** South Valley Academy

**Project:** Investigating pothole traffic

**Problem:** Pot holes affect many aspects of the road, those aspects ranging from business, car, trucks, money, and especially traffic. Such a thing is seen throughout many kinds of areas, streets, freeways, avenues, and other areas where vehicles go through. Cars and trucks (especially of the heavier kind) need to at times travel with caution in order not to be damaged. In our project, our group is investigating and simulating potholes and poor road quality's effects on traffic. Our overall goal is to create a computerized simulation on the deterring effects of potholes based on the type of vehicle, hour of the day, and the kind of location the road is located on (our main model will be based on our school's road). In the simulation, heavier trucks will slow down once they reach designated points on the road (therefore simulating trucks slowing down near potholes to avoid damage), and cars will experience a slow down as well (although not as heavily as the trucks). Based on time alterations in the code (which will simulate the time of day) the number of vehicles will increase in number; the max number will peak at around 3-4pm. The type of road will be created in separate models, the difference between them being that some roads will have an intersection, our school road will have an intersection immediately after the exit/entrance to the school. This will theoretically have a larger effect on the slowdown of vehicles and the clogging of traffic. A control model will have a smaller amount of potholes on the road, easing the traffic. This will model and determine theoretical traffic movement with and without potholes.

**Resolution:** The model will be based on roads and streets around Albuquerque at different hours of the day, ranging from rush hour to the street being empty. The program would move the vehicles at different speeds (depending on the speed limit of that road) and periodically slow down trucks and cars (trucks more than cars). The model will be able to change the amount of potholes on the road and find how much of a difference the road deficiencies really make.

**Current Progress:** At the moment, our simulation will be based off of a sample model in net logo. Roads have been set up, which the cars and trucks will one way or the other depending on their lane. We now plan to code for "potholes" on the road by implementing certain blocks on parts of the "road" which will slow down the cars and trucks when they meet them. Time of day will be based off an interval code, which will help increase or decrease the number of vehicles and their speed depending on the time. The intersections will be based off of the ones from the sample models and will act like normal intersections.

**Possibilities:** If this program is perfected, it could prove and possibly improve traffic on poor quality roads. The program could simulate the degradation of roads over time by increasing the number of potholes, thereby increasing the traffic as well. With this, many roads and freeways could be improved by deciding to fix the roads and serving as proof that the roads require repair. The implementations would use real world input and data to serve as actual data to improve city road quality. By improving the city roads, city lives are improved through the program.

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