T-125-Anant Gulati

**Problem statement:**
India ranks number 1 in the number of road accidents across 199
countries reported in the World Growth Statistics and accounts for almost 11% of the road related deaths in the world. As a new budding engineer how would you help improve road safety in India?

**Abstract of Solution:**
The number one reason for road accidents is over speeding. In 2018 overspeeding caused 66.5%(3,10,612) of road accidents. In 2019 this number went up to 71.1%(3,19,028)*. Needless to say overspeeding is causing copious amounts of damage and loss to people most of which can be easily avoided. A leading cause of over speeding is people's need to arrive at their destination faster but there is more than one way to reduce travel time.

I would recommend a three fold solution to this problem:

1. Streamlining traffic to reduce time spent and reduce the feeling of time being wasted during travel.
2. A wide spread education drive across multiple media platforms and in educational institutes.
3. Stricter enforcement of laws.

I would recommend streamlining traffic by creating a computer model to dynamically change times spent at traffic signals depending on traffic density to facilitate faster movement of traffic.

Create similar education drives as were done for we have previously done for smoking.

Laws can be more strictly enforced by may ways one such way is to let gps devices give a warning when they detect movement faster than the posted speed limit

* source: Ministry of Road Transport and Highways:Road accidents in India 2019(https://morth.nic.in/road-accident-in-india)

# Streamlining Traffic

I propose a solution to stream lining traffic by implementing a traffic light timing control model which works as a function of traffic density. It works so as to minimise the time spent waiting at a traffic light. I propose to facilitate this by integrating a communication module into every individual traffic light.

My proposed solution would view the road network as a modified version of a traditional maximum flow problem modified to take into account the unique nature of traffic.

I propose to obtain traffic density data from users mobile data and from road sensors in a method similar to that used by Google to obtain its traffic data for Google maps.

I then propose to represent the road network in a modified graph in which each traffic light is represented by a node on the graph and each road system is an edge. Each edge has a specific capacity which can be viewed as a number which represent the traffic density on the road.

Using this information, I would modify my algorithm to account for time taken between traffic lights so as to maximise the probability of getting maximum green lights.

I believe this will make road travel far more efficient thus reducing overspeeding.

# Education

I propose an education drive on a large scale which will take place primarily in primary and middle schools.

There are two advantages to making road safety a compulsory part of school curriculum. The first is that these are the same people who will eventually be driving and if they have been taught about the risks of over speeding from a young age, they are less likely to indulge in it. The second advantage is that when people see their own children teaching them about how dangerous overspeeding can be they are more likely to follow said laws.

Along with this I would also suggest educating adults through popular media. I would suggest the use of influential figures in advertisements, posters on roads etc.

# Enforcement

One great way to stop people who don't know better form breaking laws is to implement the deterrents that are already in place. The main issue right now with implementation of said deterrents is the massive scale and wide geography of law breaking. It is impractical to expect the regulating body (for example the police) to be able to stop overspeeding everywhere.

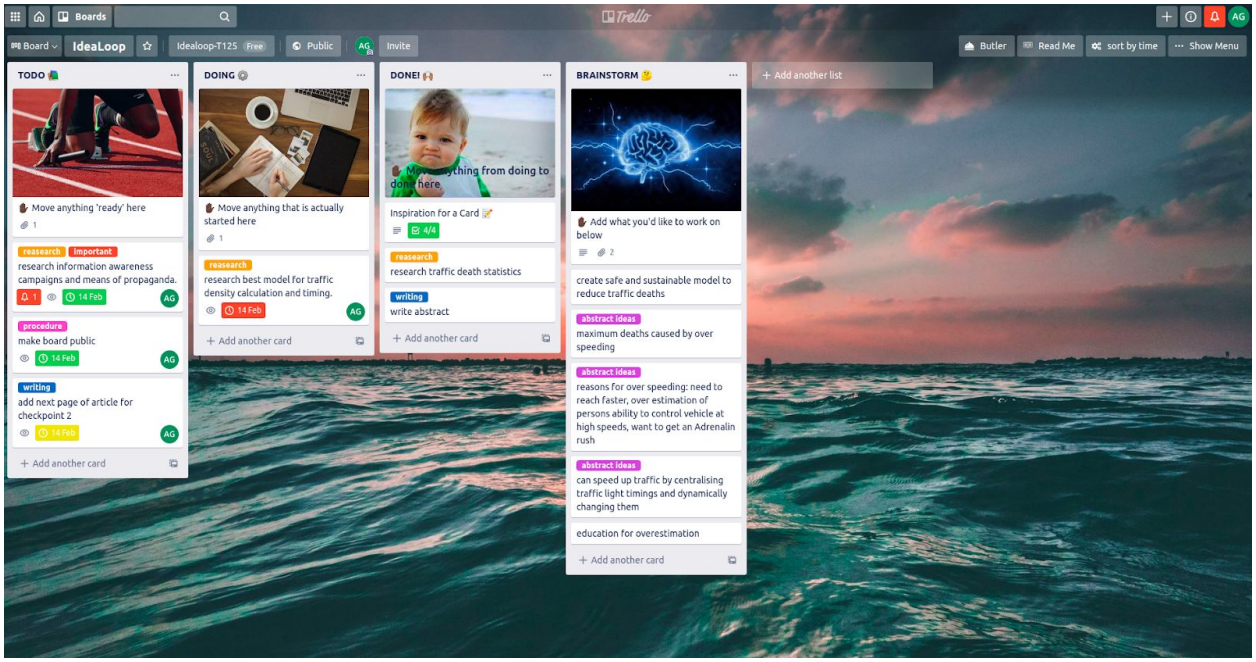
What is however possible is to reuse the technology already available with most people and use it to make the community safer.

Global Positioning Systems (GPS)  already track user location and speed. I propose linking a database of speed limits on respective roads to the extant GPS and then comparing it to the current speed of the driver.

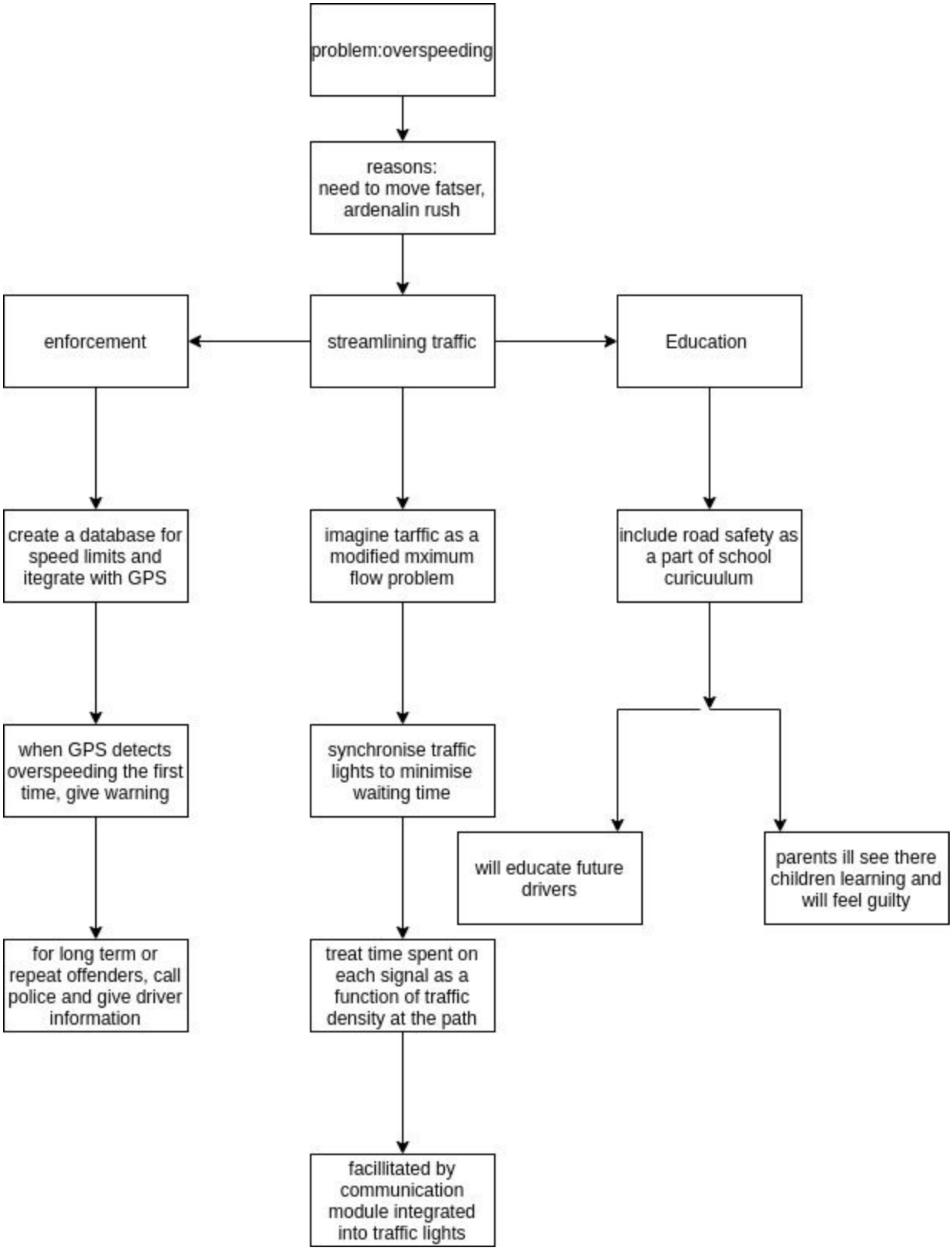
At the first instance I propose that the system simply sends a warning, but if it continues for too long send a signal to the respective agency.

If we also make it compulsory for the GPS provider to take accurate user information, the police can easily track down the offender using the driver license database

Trello board:




Trello link:
https://trello.com/b/h1AnrFpF/idealoop


problem:overspeeding
reasons:
need to move fatser,
ardenalin rush
enforcement
streamlining traffic
Education
create a database for speed limits and itegrate with GPS
imagine tarffic as a modified mximum flow problem
include road safety as a part of school curicuulum
when GPS detects overspeeding the first time, give warning
synchronise traffic lights to minimise waiting time
will educate future drivers
parents ill see there children learning and will feel guilty
for long term or repeat offenders, call police and give driver information
treat time spent on each signal as a function of traffic density at the path
facillitated by communication module integrated into traffic lights