

# Light Savers

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# Red Light Cameras Banned



- On June 9, 2019 a bill was passed to prohibit cities from operating the traffic cameras
- A potential removal process can be costly

# PROPOSAL



- Repurpose the hardware in order to optimize traffic
- Minimize the response times of emergency vehicles

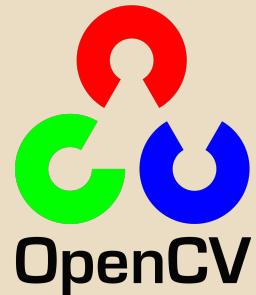
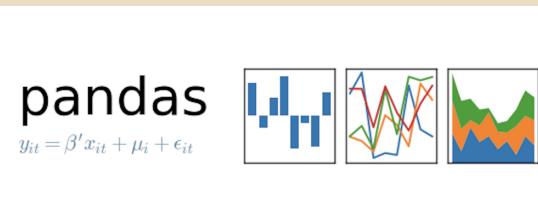
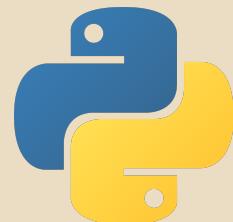
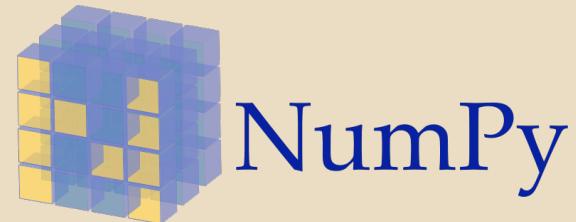
# IMPACT



When time is of the essence, every second matters. Our aim is to assist first responders by reducing the time they spend getting to where they are needed most.

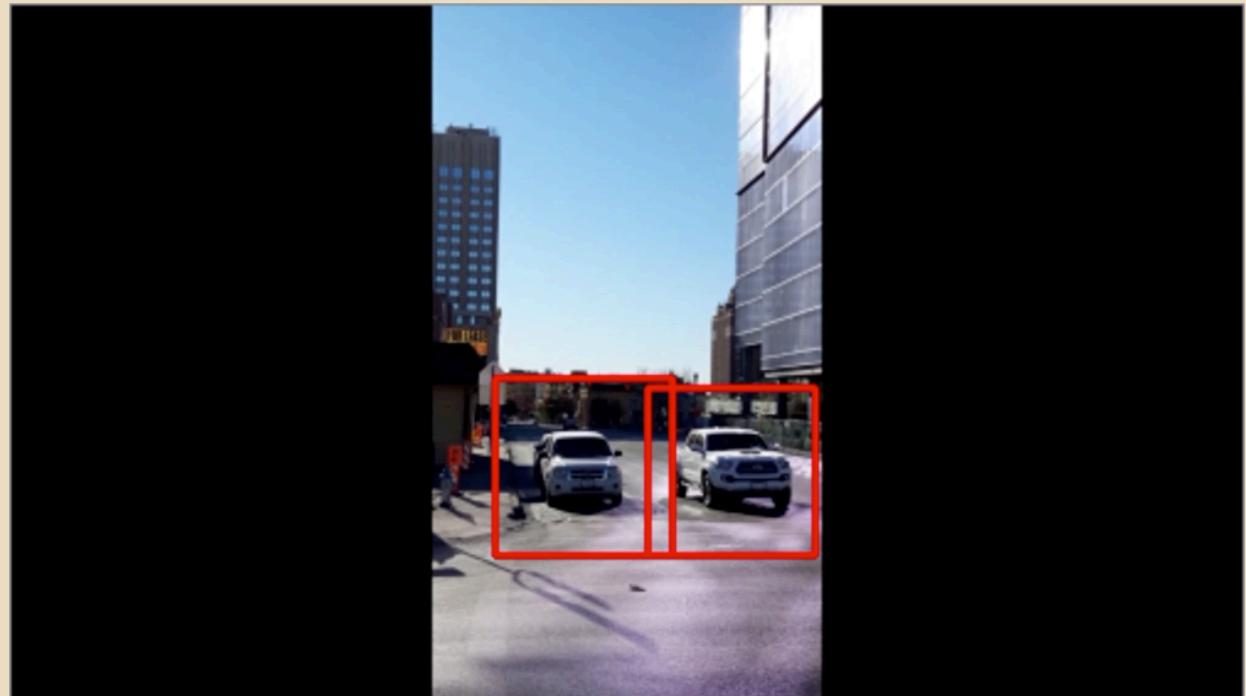
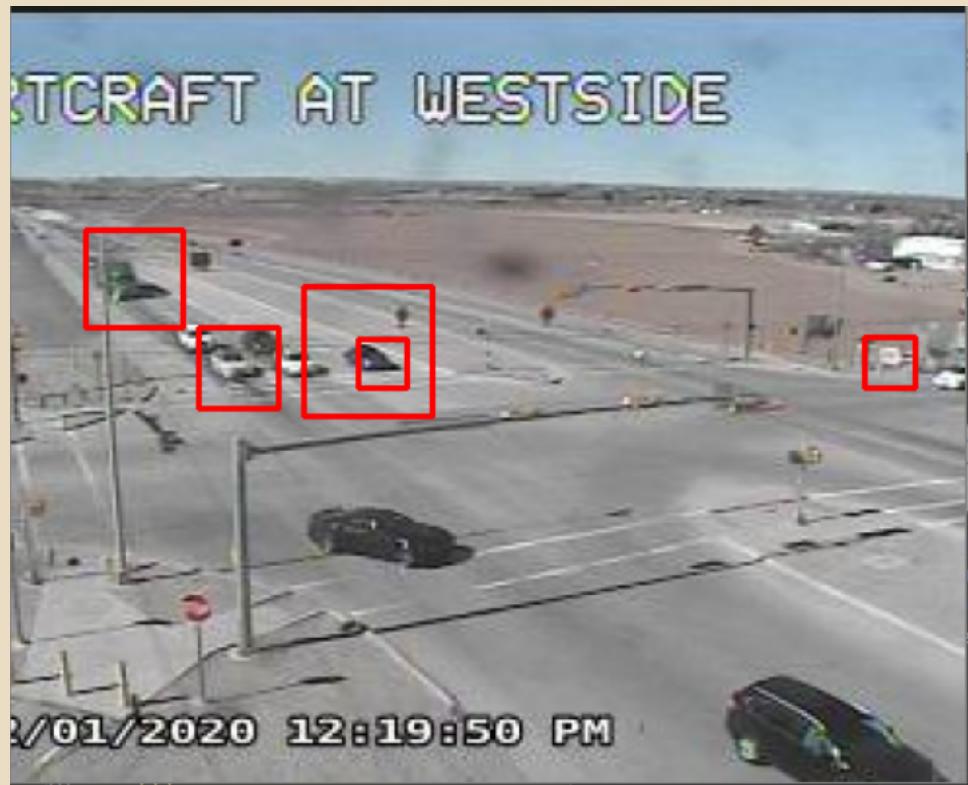


Additionally, we alleviate everyday traffic resulting in shorter commutes which in turn reduce emissions lessening our carbon footprint.





# VEHICLE DETECTION



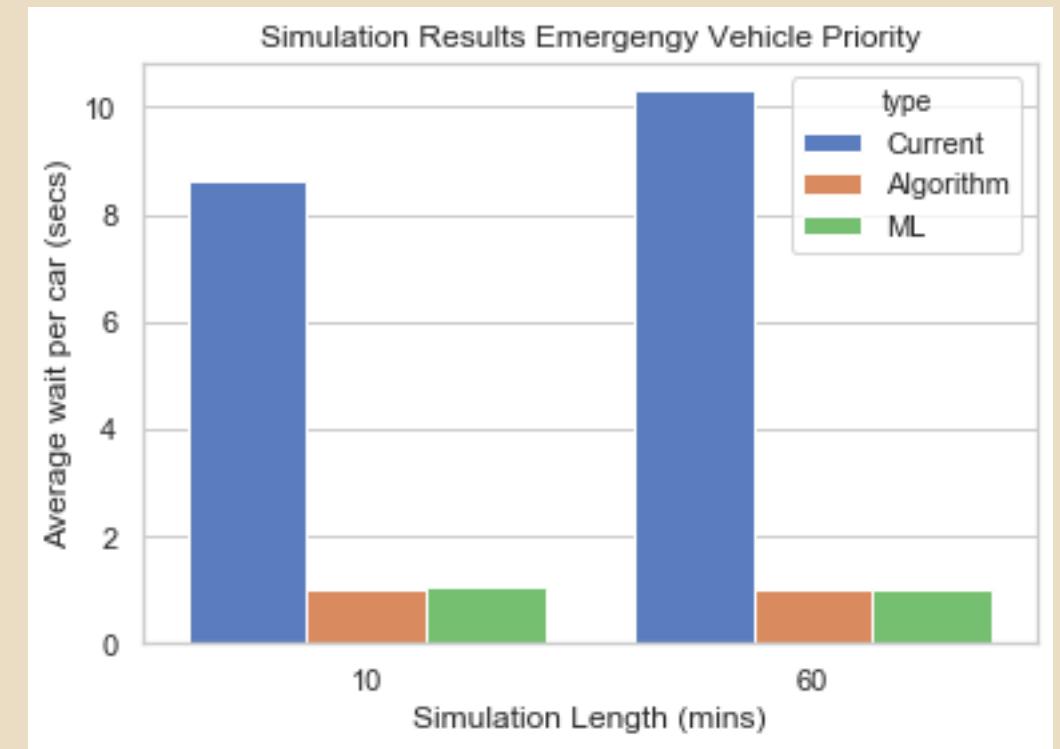
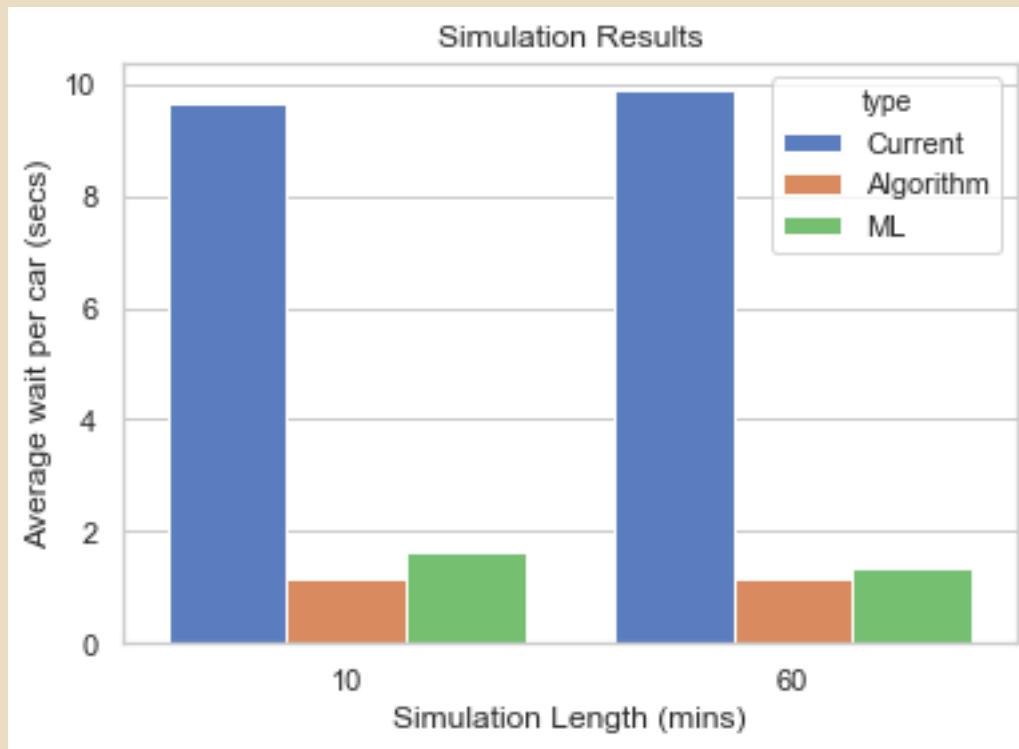
# NEURAL NETWORK MODEL

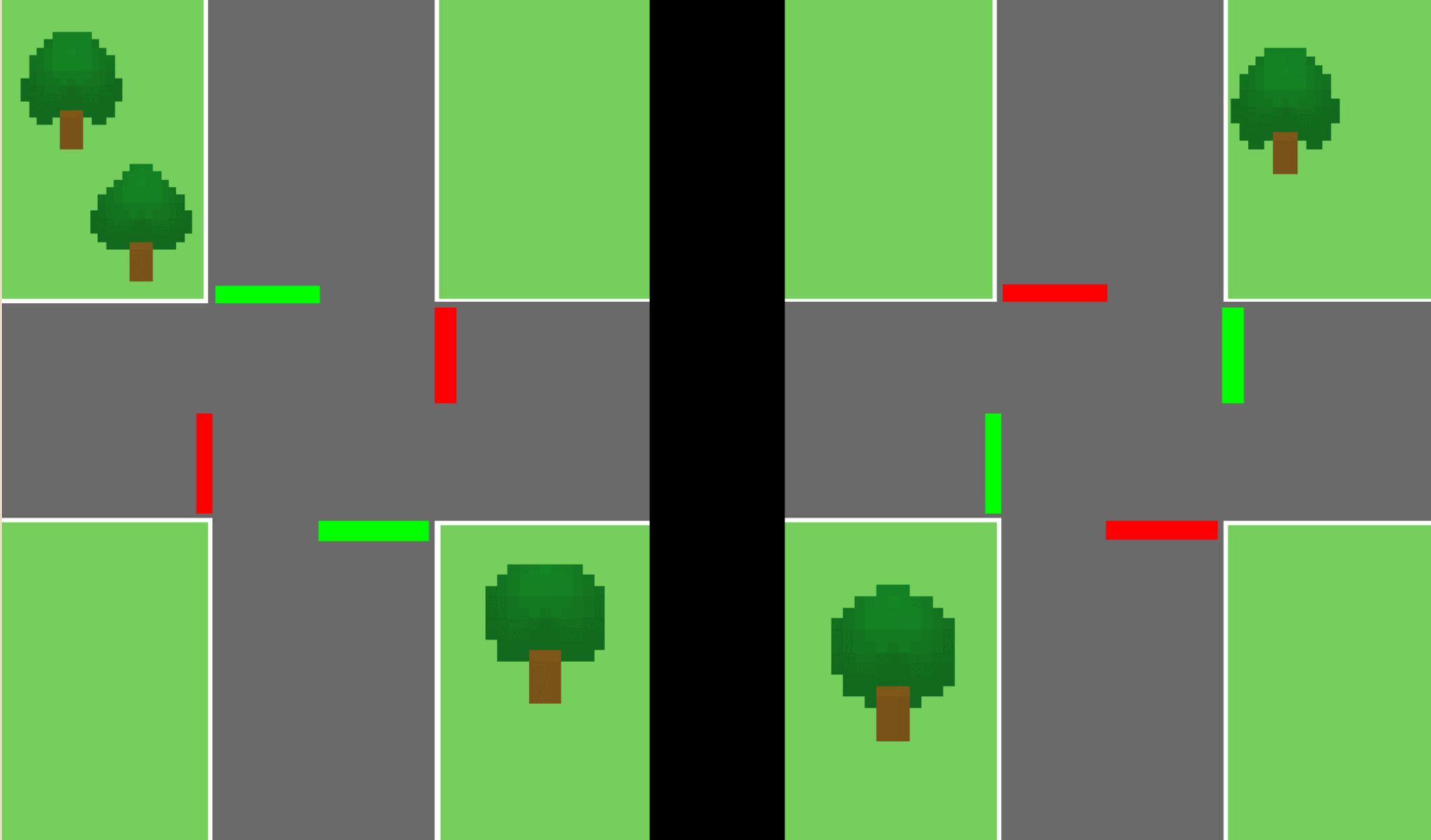


- Developed Multi-Layer Perceptron (MLP) to reduce traffic congestion by optimizing average vehicle wait time
- TxDOT requires permission to view data which was unavailable with our time constraints
- A traffic simulation was implemented based on traffic patterns observed in a real world sample
- A greedy model is implemented to obtain training data for the MLP

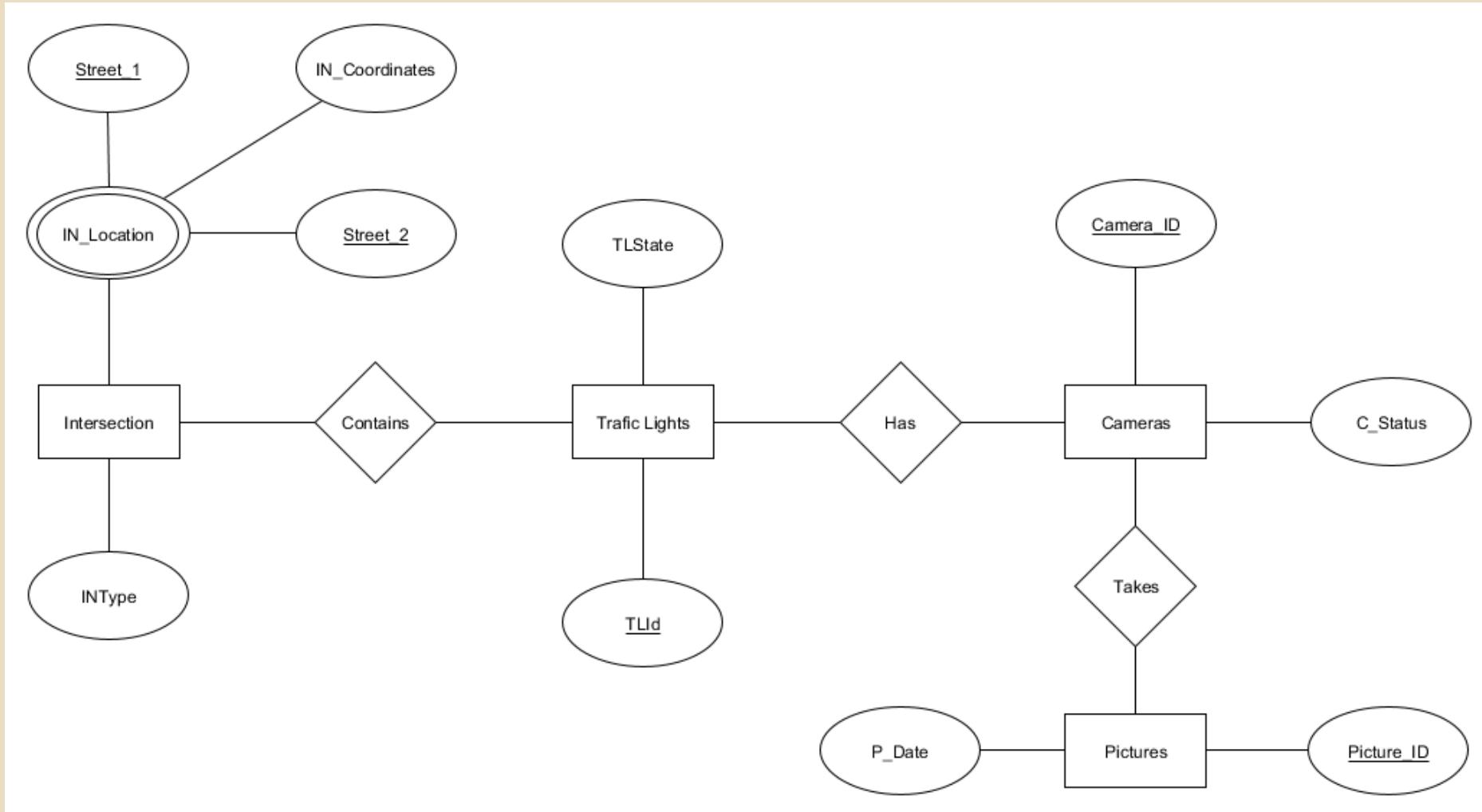


# SIMULATION & MODEL RESULTS

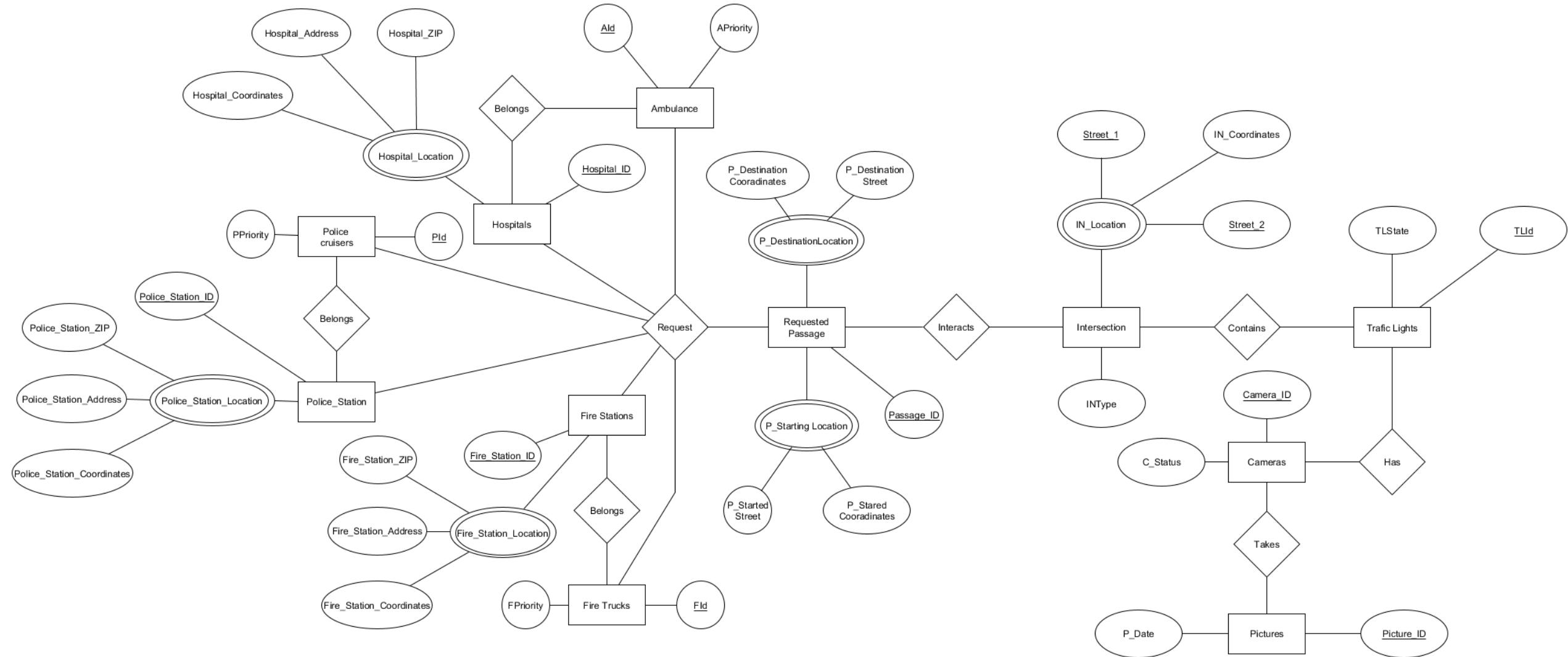




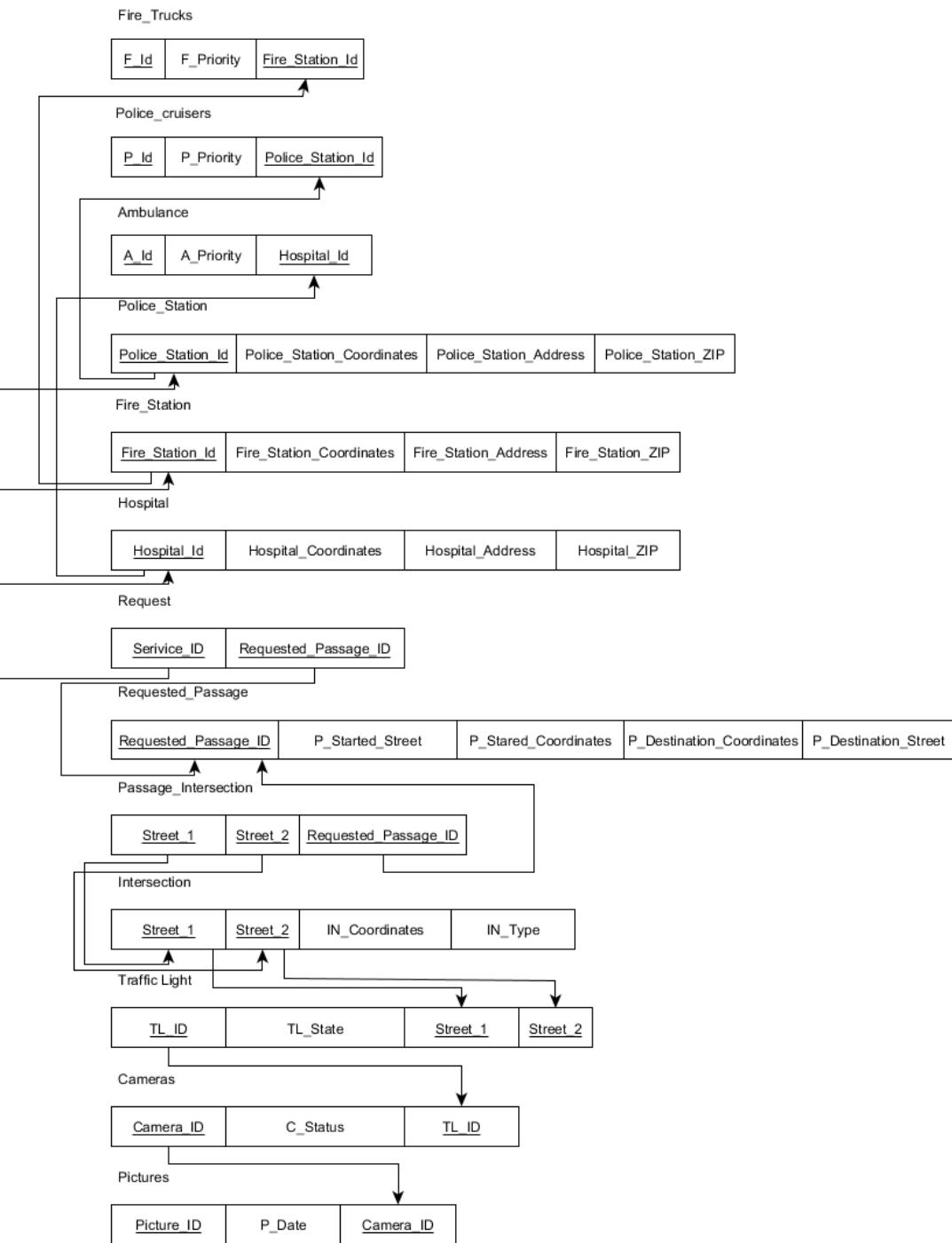
# SCALABILITY - BEFORE



# SCALABILITY - AFTER



# SCALABILITY



# SCALABILITY



TRAFFIC\_LIGHT\_DATABASE (Blokops)

Showing limited object explorer here.  
For full capability please open SSDT.

Tables

- dbo.Ambulance
- dbo.Cameras
- dbo.Fire\_Station
- dbo.Fire\_Trucks
- dbo.Hospital
- dbo.Intersection
- dbo.Passage\_Intersection
- dbo.Pictures
- dbo.Police\_cruisers
- dbo.Police\_Station
- dbo.Request
- dbo.Requested\_Passage
- dbo.Traffic\_Light

Views

Stored Procedures

Query 1 X

Run Cancel query Save query Export data as json Export data as .csv Export data as xml

```
1 select schema_name(t.schema_id) as schema_name,
2      t.name as table_name,
3      t.create_date,
4      t.modify_date
5  from sys.tables t
6 order by schema_name,
7          table_name;
```

Results Messages

Search to filter items...

schema_name	table_name	create_date	modify_date
dbo	Ambulance	2020-02-02T07:32:39.6270000	2020-02-02T07:32:39.6270000
dbo	Cameras	2020-02-02T07:49:58.6430000	2020-02-02T07:49:58.6430000
dbo	Fire_Station	2020-02-02T07:34:29.6730000	2020-02-02T07:34:29.6730000
dbo	Fire_Trucks	2020-02-02T07:30:16.1900000	2020-02-02T07:30:16.1900000
dbo	Hospital	2020-02-02T07:35:32.4400000	2020-02-02T07:35:32.4400000
dbo	Intersection	2020-02-01T20:10:41.1530000	2020-02-01T20:10:41.1530000
dbo	Passage_Intersection	2020-02-02T07:38:05.0330000	2020-02-02T07:38:05.0330000
dbo	Pictures	2020-02-02T07:50:33.5330000	2020-02-02T07:50:33.5330000

Query succeeded | 1s



# PRACTICALITY

- Implementing a model that accounts for all intersections is computationally and practically infeasible.
- In a production environment, a more distributed approach will yield best results.
- By using a reinforcement learning model, the system will coordinate intrinsically.



# COMMERCIAL VIABILITY



The intention of this project is not to maximize profit but rather improve our community and its quality of life. However, there are opportunities to generate revenue by selling this software as a service to city governments where:

- An initial version is installed for a one time fee.
- Data generated from initial version is collected and leveraged for a more robust version on a recurring fee.





# Find our project on GitHub!

<https://github.com/camendoza7/EPStrongHackathon-LightSavers>