ParkRider

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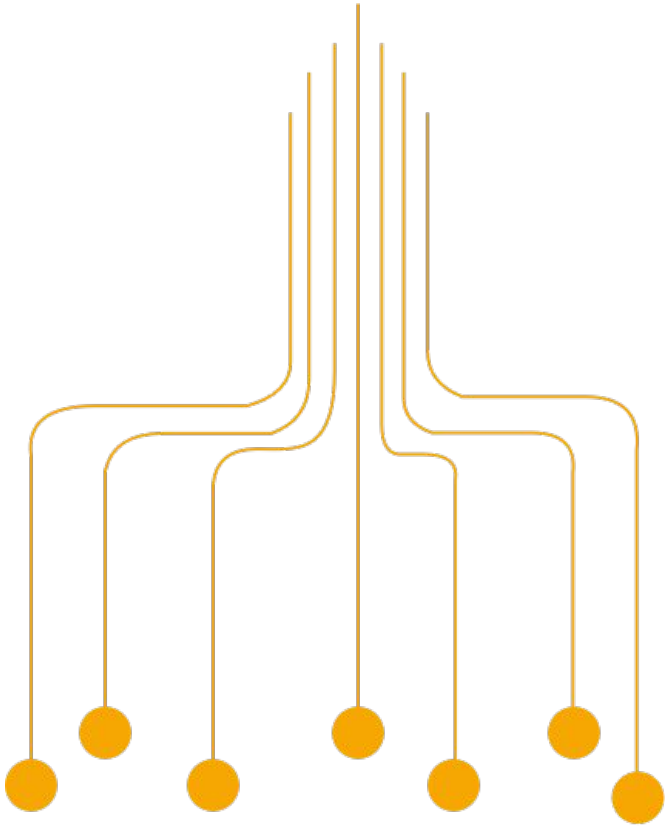
Problem

Congestion

Public transportation is a solution

but...

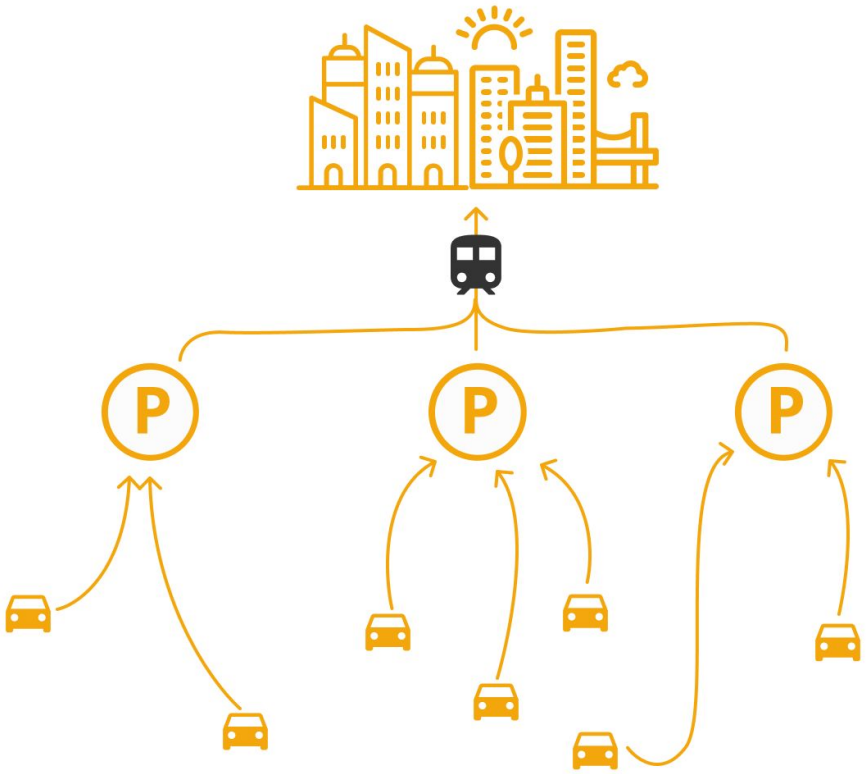
People live too far from central transit hubs



Why not drive to these hubs...?

- Everyone else thinks the same way
- Convenient parking lots get full
- The congestion problem is just moved to another location

Solution



Load balance traffic across parkades

Predictive Model

- Use past data to suggest less crowded locations

Intent Model

- Use current commuter data to predict real time congestion data

Predictive Model

We use machine learning with past parking data to predict congestion levels based on location and time of day.

- PayByPhone location data
- Parking meter data

The city is split into a grid and street parking data is aggregated for each of these lots. A predictive congestion score can be generated for each lot.

Intent Model

We can use current commuter usage patterns to make real time suggestions.

For example, if 10 people are planning to head to lot A, then lot B might be suggested instead to balance out the network.

Users are also asked to survey the lot after they park to provide on-site data.

Demonstration

Backend Prototype

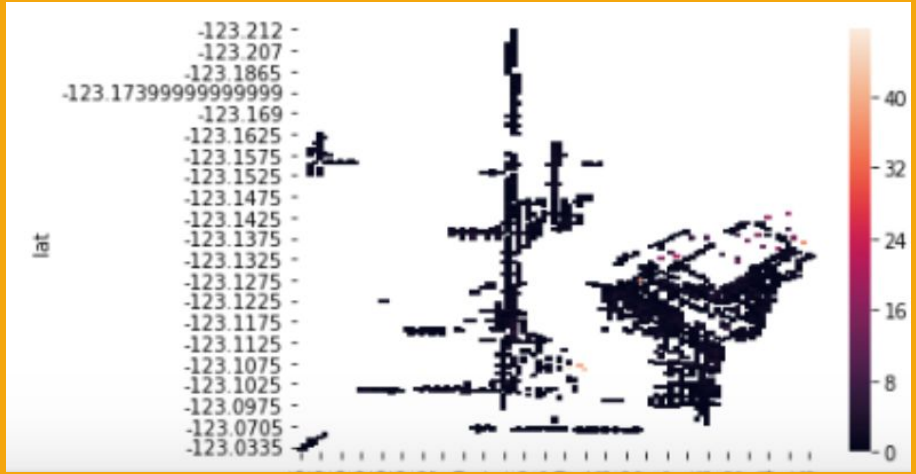
POST localhost:3000/sign... POST localhost:3000/sign... POST localhost:3000/sign... GET localhost:3000/sign

POST localhost:3000/getroute

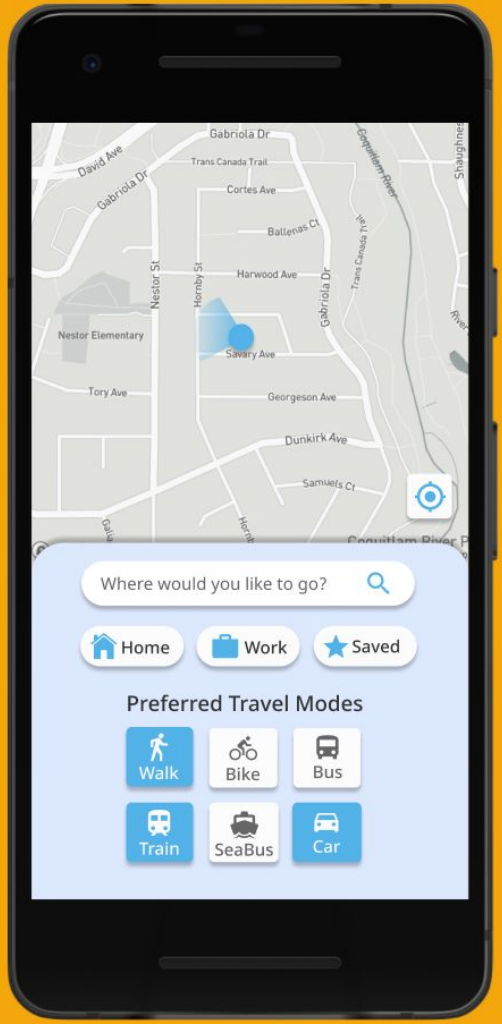
Pretty Raw Preview Visualize BETA JSON


```
{
    "routes": [
        {
            "driving destination": "425 Robson St, Vancouver, BC V6B 6L9",
            "Transit route": {
                "duration": "23 mins",
                "distance": "3.4 km",
                "steps": [
                    {
                        "instruction": "Walk to Westbound W Georgia St @ Homer St"
                    },
                    {
                        "instruction": "Bus towards N24 Lynn Valley Nightbus"
                    },
                    {
                        "instruction": "Walk to Vancouver, BC V6G 1Z4, Canada"
                    }
                ]
            }
        },
        {
            "driving destination": "578 Carrall St, Vancouver, BC V6B 5K2",
            "Transit route": {
                "duration": "29 mins",
                "distance": "4.3 km",
                "steps": [
                    {
                        "instruction": "Walk to Eastbound W Pender St @ Hamilton St"
                    },
                    {
                        "instruction": "Bus towards N24 Lynn Valley Nightbus"
                    },
                    {
                        "instruction": "Walk to Vancouver, BC V6G 1Z4, Canada"
                    }
```


1	2	3	4	5	6	...	15	16	17
000	0.250000	0.250000	0.425170	0.425170	0.425170	...	0.250000	0.250000	0.250000
000	0.250000	0.250000	0.680272	0.680272	0.250000	...	0.250000	0.250000	0.340136
000	0.250000	0.250000	0.250000	0.250000	0.340136	...	0.680272	0.340136	0.250000
136	0.340136	0.340136	0.680272	0.680272	0.680272	...	0.340136	1.020408	0.250000
000	0.250000	0.250000	0.250000	0.250000	0.250000	...	0.250000	0.250000	0.425170
...	...	...	...	...	...	...	...	...	...
000	0.125000	0.125000	0.125000	0.170068	0.170068	...	0.125000	0.340136	0.510204
000	0.125000	0.125000	0.125000	0.125000	0.125000	...	0.170068	0.170068	0.340136
000	0.125000	0.125000	0.125000	0.125000	0.125000	...	0.212585	0.637755	1.275510
000	0.125000	0.125000	0.125000	0.125000	0.125000	...	0.850340	1.488095	1.275510
000	0.125000	0.125000	0.125000	0.125000	0.125000	...	0.125000	0.212585	1.062925



Frontend Prototype



Scaling into the Future

Future Work

- This system can be expanded beyond just cars and parking to help balance out transit routes as well.
- Include and suggest more mixed modes of transportation such as car sharing, bike sharing, microtransit (e-scooters)