

CycleSafe

Route Planning for Urban Cyclists

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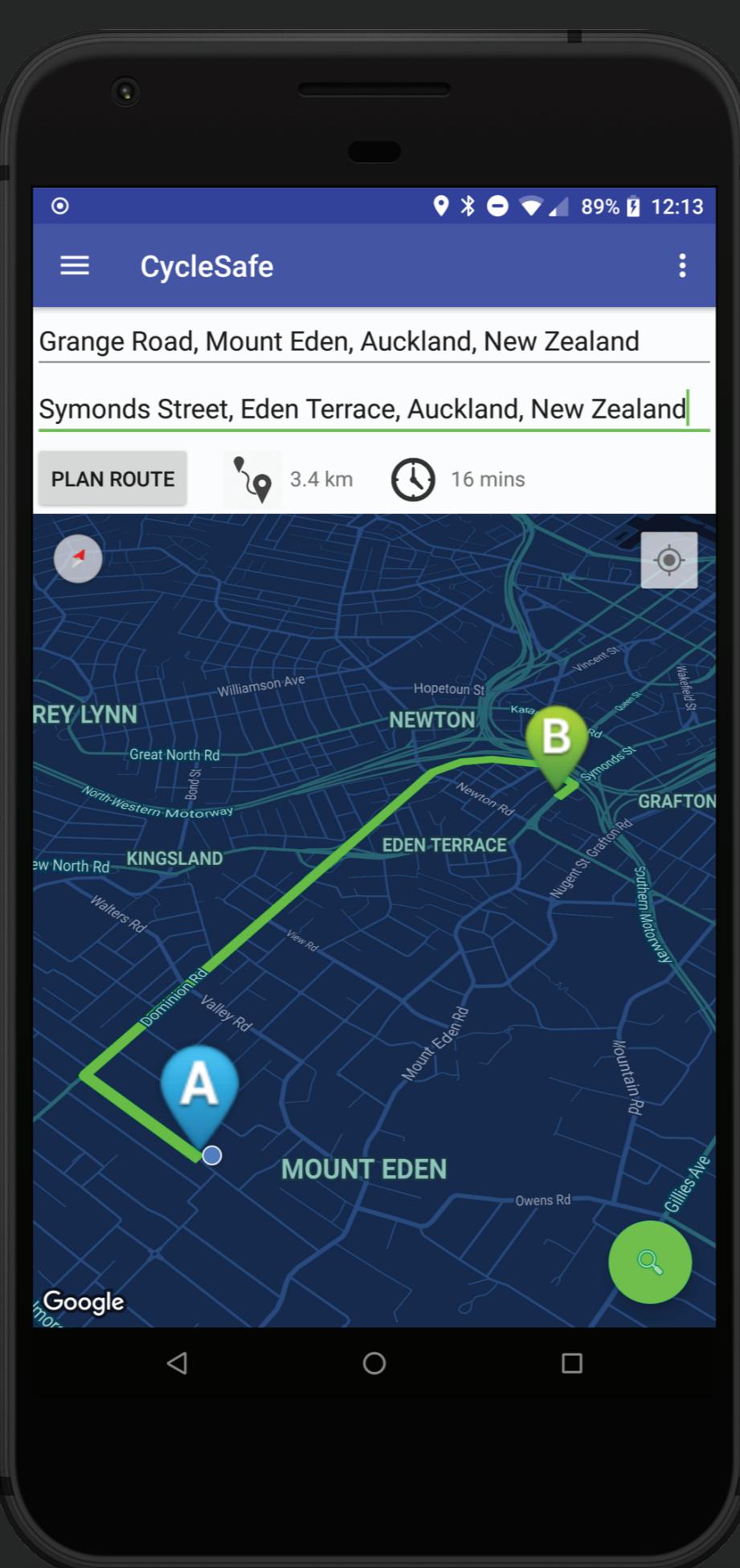
Background

Due to the 62% increase in urban cycling trips over the last few years, it has become much more important to raise the level of cycling safety in Auckland. Traffic congestion in Auckland has also been increasing every year. This poses an issue as cyclists have to share the road with motorists. The increase in both motor vehicles and cyclists on the road poses increases the risk of injury for cyclists, thus there must be work done to ensure that cyclists are safe on the roads.

Besides awareness campaigns, there is little work done to solve the issue of cyclist safety. Cyclists have many risk factors which do not affect the vehicles around them, they have much lower levels of protection in terms of accidents which can result in injury or death. However, they also have no protection against weather changes and in a city like Auckland which can undergo many weather changes in a single day. It is important for cyclists to be aware of these changes to ensure they are not commuting in unsafe conditions.

Our Solution

- » Route planning phone app that provides users with safe routes.
- » Gives cyclists a way to travel safely avoiding congested roads & poor weather conditions.
- » GPS data taken from Google & Bing APIs
- » Weather Data taken from Wunderground API & gives users weather, visibility and headwind info
- » App has multiple modes allowing for different methods of cycling.



Problem Statement

- » The main problem that has been analysed is the safety of cyclists using the roads.
- » Currently, cyclists have no way to plan their commute routes which take safety into account.
- » Whilst there are existing applications which provide valid route planning solutions, none of them take traffic congestion or weather conditions into account.
- » These are the most factors in determining cyclist safety and must be considered to ensure that cyclists have the safest route possible.

Features

- Commute Mode:** Provides safest path between two points using traffic & weather data to ensure cyclist safety.
- Exercise Mode:** Provides a safe exercise route based off a target distance input, also provides weather warnings.
- Machine Learning:** App predicts congestion based on common user routes & provides warnings on unsafe travel periods.

Conclusion

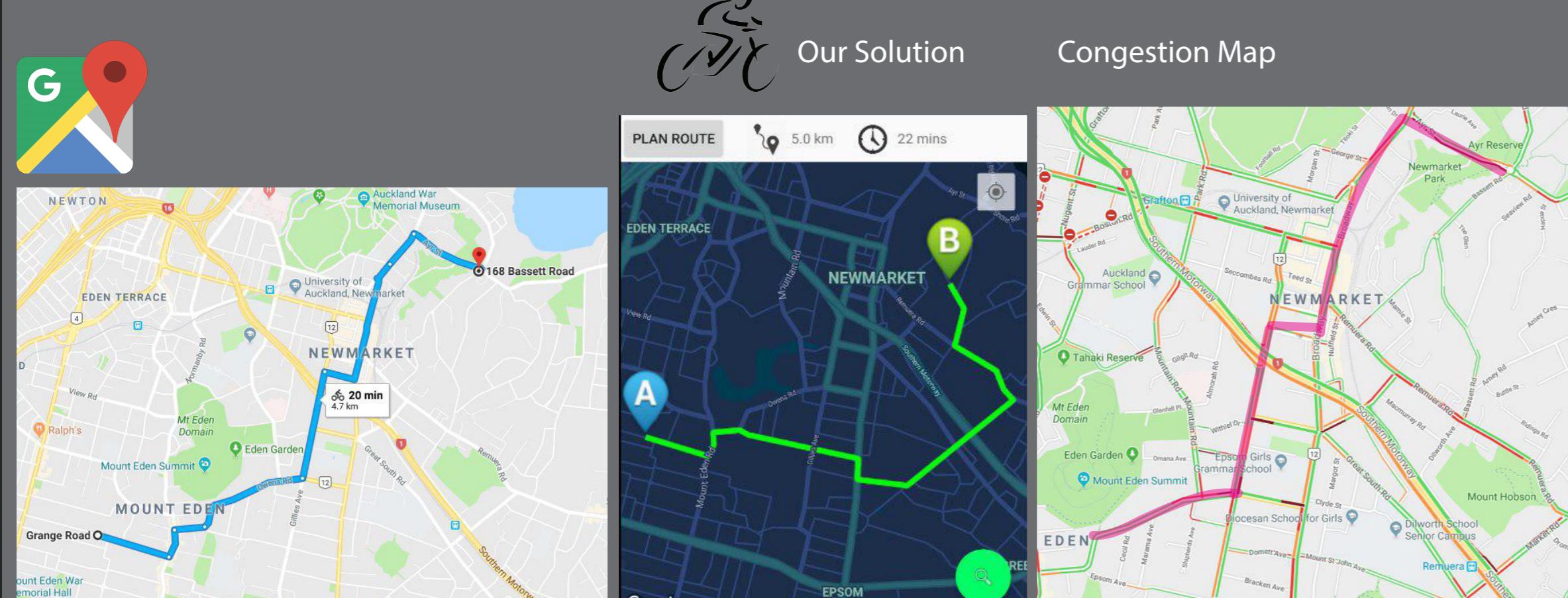
Due to the increase in urban cyclists and traffic congestion, tools for safe cyclist route planning are of great need.

Results show that by considering traffic status, and weather conditions, our route planning application can avoid traffic and provide weather warnings to help plan a safe journey.

The results show an improvement in route planning as it avoids medium to heavy traffic congestion, thus improving cyclist safety.

Results

Our app plots efficient, but safer paths compared to existing applications.



Future Work

- » Integrate multiple data sources like Taxi data & other online services such as HERE maps for more reliable traffic data.
- » Bike sharing service integration
- » User stat tracking
- » GPS tracking & audio direction queues.