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Automatic Generation of Push Notification Alerts of Approaching Emergency Vehicles

ABSTRACT

In congested cities, it can be difficult for an ambulance or other emergency vehicle to reach a location from which the vehicle is requested. Delay in the arrival of such vehicles is a waste of crucial time due to the emergency nature of the task for such vehicles. This disclosure describes techniques to address the above deficiencies through an alert notification system in a navigation or maps application (app). Vehicles along the route of the emergency vehicle are identified automatically, e.g., based on location information shared from such vehicles via their navigation app. Appropriate notifications are generated and sent to such vehicles. The notifications can include information that an emergency vehicle is approaching and optionally, a suggested action for the vehicle. Vehicles that cannot directly receive push notifications can be notified through vehicle-to-vehicle communication or via on-board sensors.

KEYWORDS

- Emergency vehicle
- Ambulance
- Traffic clearance
- Push notification
- Navigation application
- Digital map

BACKGROUND

In congested cities, it can be difficult for an ambulance or other emergency vehicle to reach a location from which the vehicle is requested. Delay in the arrival of such vehicles is a waste of crucial time due to the emergency nature of the task for such vehicles, e.g., medical emergencies, fires, etc. Further, ambulances need to identify the nearest suitable medical facility and reach those quickly, which may be hindered by traffic along the route. Still further, drivers of vehicles that are alerted of an emergency vehicle behind them have difficulty making an

appropriate choice, e.g., stop, make a right/left turn, etc. due to traffic conditions. Delays may also occur due to bottlenecks at road junctions.

DESCRIPTION

This disclosure describes techniques to address the above deficiencies through an alert notification system in a navigation or maps application (app).

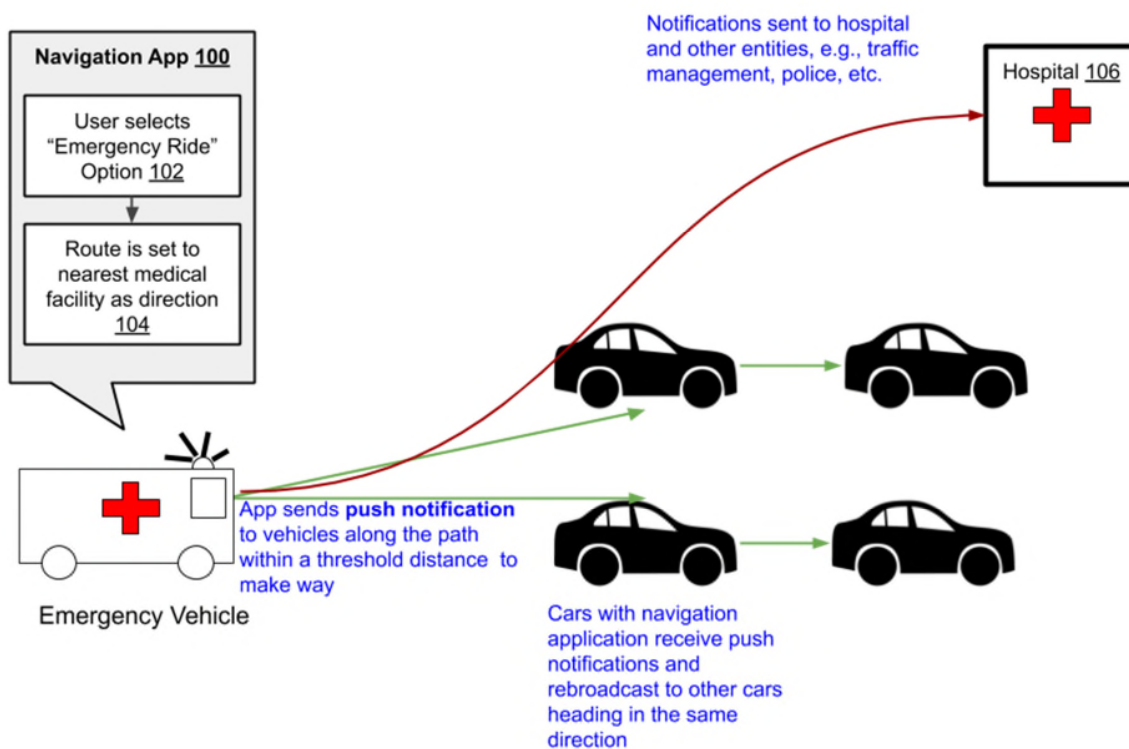


Fig. 1: Example of push notifications sent by a navigation app to vehicles using the same app

Fig.1 illustrates an example scenario of a navigation application (100) that is in use in an emergency vehicle (ambulance, e.g., as part of an on-board navigation system. a mobile device that is in use in the vehicle, etc. When the user (e.g., driver of the emergency vehicle) is ready to commence a ride, the user selects the 'Emergency Ride' option (102) in the navigation app. Upon such selection, a route (104) to the nearest medical facility is selected in the navigation app.

Per techniques of this disclosure, as the emergency vehicle starts moving in the direction of the destination, vehicles that are on road segments in the direction of travel and can potentially cause a delay are automatically identified. For example, such vehicles may utilize the same navigation app or otherwise provide their location data for emergency use, which can be used to identify such vehicles (with user permission). Traffic and/or maps application-programming interfaces (APIs) can be used to access such data.

Push notifications, e.g., in-app push notifications in the navigation app, are generated and sent to the identified vehicles that are within a threshold distance of the ambulance, indicating that the vehicle should make way for the ambulance. Actions, such as “stop at the shoulder,” “make a right/ left turn,” “change lanes,” etc., can also be suggested via the push notifications. Such notifications enable quick decision making by other vehicles along the route to the destination.

Further, the navigation apps in these vehicles can rebroadcast the information that an emergency vehicle is about to pass to the other vehicles that may not have the navigation app. For example, such vehicles can be notified via available sensors, e.g., using vehicle-to-vehicle communication, via Internet-of-Things sensors on-board the vehicles, etc.

Still further, notifications can also be provided to nearby road junctions, police officers, hospital staff, etc. indicating that the emergency vehicle is on the way. This can enable operational bottlenecks to be cleared and the emergency facility (e.g., hospital) to be ready to receive the emergency vehicle.

The navigation app in the emergency vehicle (and other vehicles along the route) may send information to a server, e.g., regarding its location, destination, nature of emergency, etc. The server, e.g., that provides navigation assistance to other vehicles via their navigation apps,

can automatically identify vehicles along the route (e.g., that use the app via a mobile device or an on-board infotainment system) and generate and send appropriate push notifications. The described techniques can be implemented in maps/ navigation apps, can be implemented by mobile telephony operators, social media providers, etc. to provide emergency alerts.

Further to the descriptions above, a user is provided with controls allowing the user to make an election as to both if and when systems, programs or features described herein may enable collection of user information (e.g., a user's current location, destination, navigation route, speed of travel, or a user's preferences), and if the user is sent content or communications from a server. In addition, certain data may be treated in one or more ways before it is stored or used, so that personally identifiable information is removed. For example, a user's identity may be treated so that no personally identifiable information can be determined for the user, or a user's geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level), so that a particular location of a user cannot be determined. Thus, the user may have control over what information is collected about the user, how that information is used, and what information is provided to the user.

CONCLUSION

This disclosure describes techniques to address the above deficiencies through an alert notification system in a navigation or maps application (app). Vehicles along the route of the emergency vehicle are identified automatically, e.g., based on location information shared from such vehicles via their navigation app. Appropriate notifications are generated and sent to such vehicles. The notifications can include information that an emergency vehicle is approaching and optionally, a suggested action for the vehicle. Vehicles that cannot directly receive push notifications can be notified through vehicle-to-vehicle communication or via on-board sensors.