

Semi-Automated Emergency Response Systems

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Problem Statement

Need: Emergency vehicles (EVs) to reach their destinations in a timely manner

Challenges:

- Road congestion
- May need to perform risky maneuvers
- Drivers may not hear a siren

Some Stats:

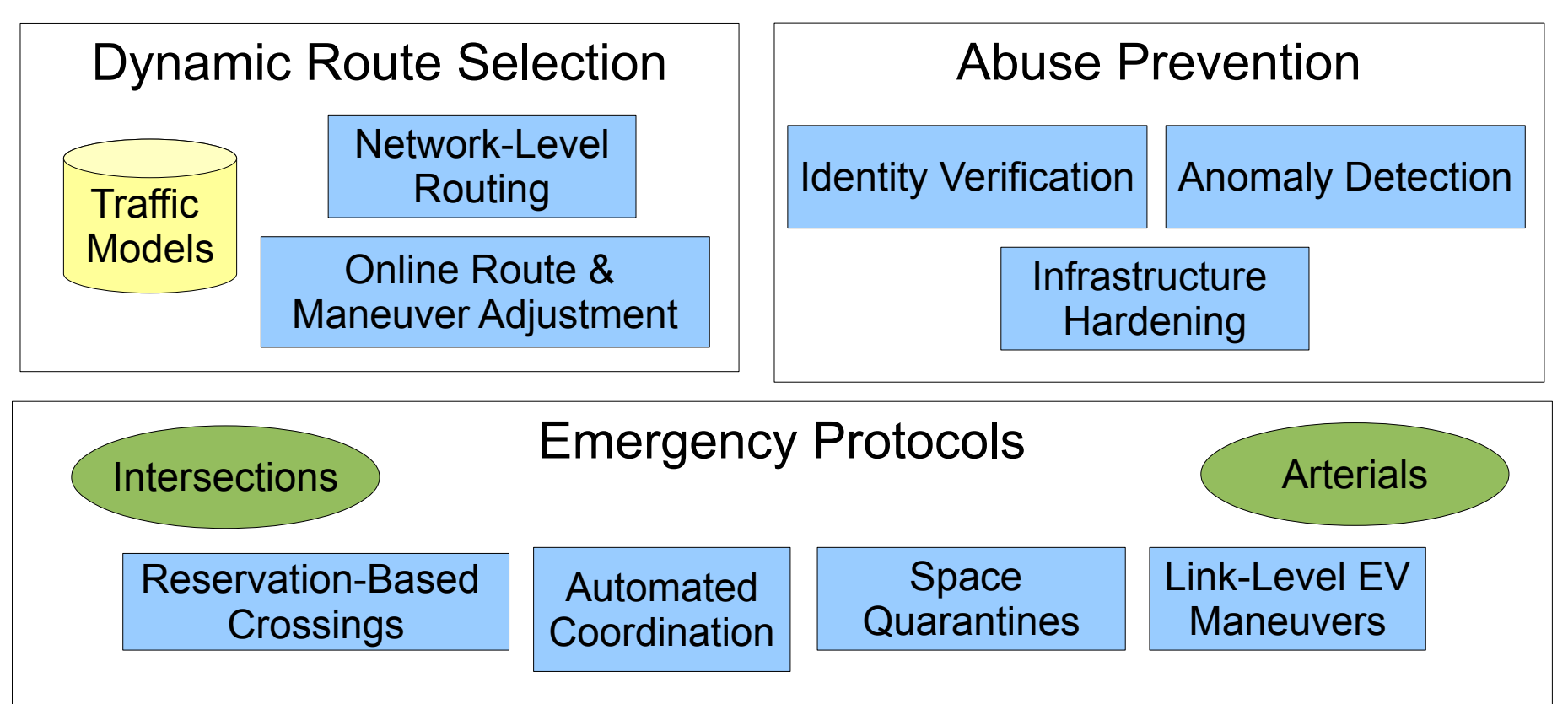
- Between 1988-1997, there were over 200,000 emergency vehicle crashes [Becker et al. 2003]
- Crashes result in fatalities, injuries, property damages, and fewer available emergency service providers [Becker et al. 2003]

Solution: A semi-automated, efficient, and secure emergency response system.

Main Ideas

1. Exploit connected vehicle technology to help the coordination between the EVs and non-EVs.
2. Design an automated module that can be plugged into a vehicle to assist with decision making and maneuvers.

Framework



Impact on Smart Cities

This project will advance the quality of transportation systems in smart cities by

- Minimizing the chance of emergency personnel getting hurt on the job
- Ensuring the safety of non-emergency vehicles (non-EVs)
- Reducing delays, which increases productivity and quality of life of drivers
- Allowing increased connectivity with emergency care facilities to better manage loads
- Providing a stepping stone toward the realization of a fully-automated transportation system

Model & Features

System Model: Vehicles are operated by human drivers. Some vehicles may not be connected.

Protocols: Optimize EVs and non-EVs' behaviors. Design plug-and-play module.

Abuse Prevention: Harden infrastructure. Provide identity verification.

