Deploying CV2X Infrastructure on Highway I-275

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Motivation & Objective

Transportation System-level Benefits
- Emission Reduction
- Energy Efficiency Improvement
- Productivity Increase

Connected Automated Vehicles + Intelligent Road Infrastructure = High-efficiency Transportation System

System-level Optimization
- Maneuver Coordination
- Onboard Energy Management

Bridging the Connectivity Gap with Infrastructure

Traffic prediction using THM & TPM

- Traffic history message (THM): customizable message containing motion history of past few minutes (speed, lane, …).
- Traffic prediction message (TPM): customizable message containing motion prediction based on THM and RSU position.
- THM and TPM can be transmitted between V2X devices using WSMP and transmitted to server using MQTT.
- Downstream vehicle obtains its predicted speed trajectory based on TPM and design optimal controllers.

Deployment & Experiments

- Designed new types of V2X communication messages and built communication channels between RSUs and server for real-time traffic prediction.
- Deployed V2I devices on I-275 highway and conducted real-vehicle test.