

Research Title:

Queueing-Based and Data-Driven Design of Emergency Transportation Services

Primary Investigator:

Name: **Dr. Yossi Luzon**

Faculty: **School of Industrial Engineering and Management**

Academic Institute: **Afeka Academic College of Engineering in Tel Aviv**

This report presents the key outcomes of a two-stage novel study focused on enhancing emergency transportation services through operations research and data-driven approaches. The first stage explores low-traffic conditions in emergency response systems (ERS), providing empirical insights that challenge traditional assumptions and introduce new low-traffic queueing models to optimize resource allocation and decision-making. The second stage develops a novel queueing model that accounts for hierarchical crew structures in emergency vehicle fleets, offering a more accurate and efficient capacity planning tool. Both studies significantly contribute to the advancement of smart transportation, promoting optimized resource utilization and reduced response times. They also support the vision of "zero externalities" and emphasize the importance of interdisciplinary collaboration between operations research and emergency management.