The objective of this work is the investigation of the impacts of a traffic incident occurrence on a central urban road network in Athens and its management, through the implementation of alternative traffic control scenarios, using the microscopic traffic simulation software package, PTV VISSIM (www.ptv.de). In order to evaluate the results, travel time, delays, number of stops per vehicle and queue length were defined as measures of operational performance. The first scenario is related to the intervention in traffic signal programs of the road axis where the incident occurred, while the guidance of drivers to an alternative route by information provided through a Variable Message Sign constitutes the second scenario. The application of these models, indicates that the traffic conditions are significantly improved during the first scenario, whereas during the second scenario the deterioration in the traffic conditions of the road segments of the alternative route is more serious than the improvement succeeded.

**Study Area and Dataset**

- Length of analyzed network: 25 km (includes 33 signalized intersections)
- It includes Alexandras Avenue – Kifissia Avenue – Mesogeion Avenue – Katechaki Avenue, the greater area of the intersection Vasilissis Sofias Avenue – Zacharou – Mesogeion Avenue, Fidipidio Street and Panormou Street
- Traffic data during the morning peak hour (08:00 – 09:00) (Source: Traffic Management Centre)
- Incident duration: 20 minutes
- Consequences due to the incident occurrence: one lane blockage on Kifissia Avenue

**Result Analysis and Comparison**

**Measures of Operational Performance**

**Scenarios**

- travel times,
- delays,
- average number of stops per vehicle and queue length.

**Comparison of travel times**

**Comparison of delays**

**Comparison of average number of stops per vehicle**

**Conclusion**

- The values of travel times, delays and queue lengths are significantly increased, especially in the case of “Zero” Scenario.
- Meaningful improvement of all the measures of operational performance for all the critical segments when the 1st Scenario is implemented.
- The use of VMS improves the values of the measures of operational performance of some segments but its negative impact on other road segments causes additional traffic issues.
- The intervention in the signal plans of the road axis where the incident occurred was revealed to be more efficient and effective when compared with the use of VMS.

**Further Research**

- Simulation of different incident characteristics, such as duration, location and consequences.
- Analysis, evaluation and comparison, through microscopic simulation, of other incident management strategies (e.g. actuated traffic signal).

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