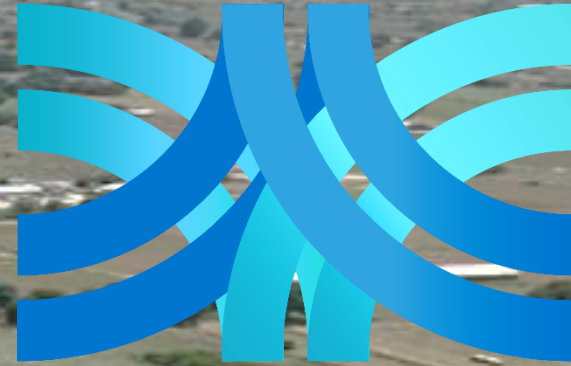


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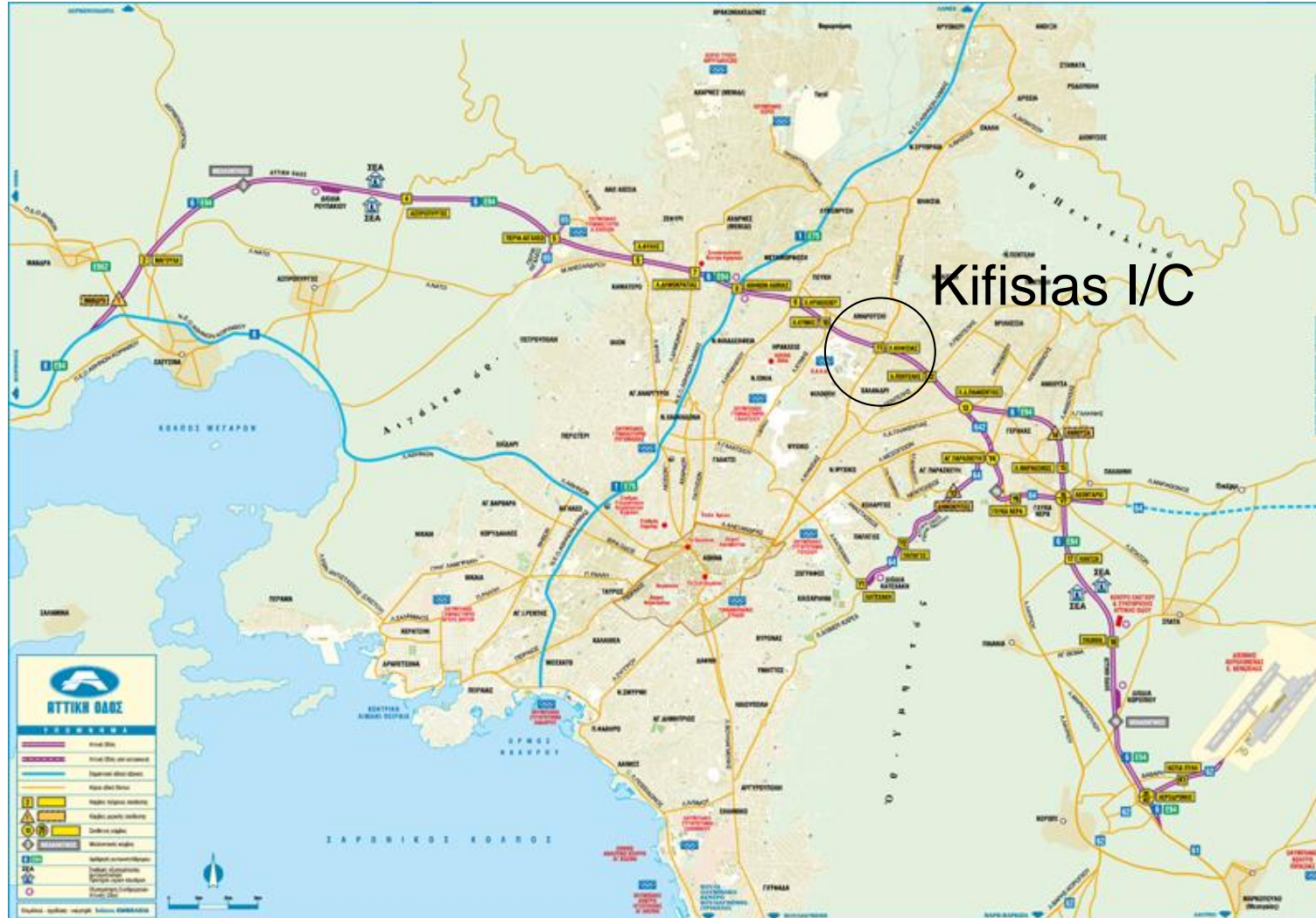
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Off-Ramp Delay Optimization through Signal Control Intervention – The case of the "Kifissias Ring" intersection of Attica Tollway

**Dimitris Sermpis, PhD
Traffic Engineer
Attica Tollway**

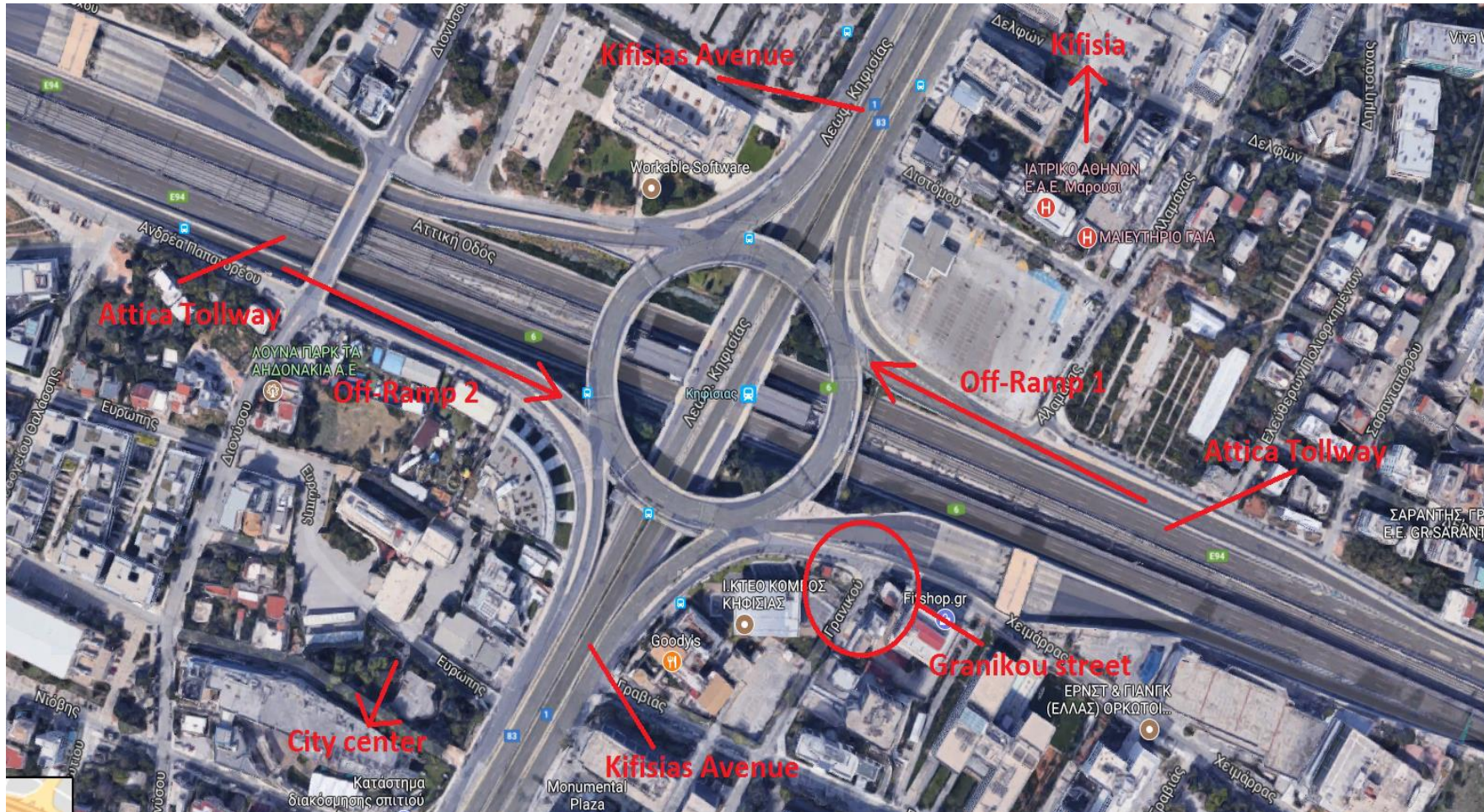
STUDY LOCATION



STUDY CHARACTERISTICS

- Critical Interchange connecting Attica Tollway and Kifisias Avenue (main road linking the city center to the South Suburbs)
- Regulation via Roundabout & Traffic Signals
- Fixed-time Signal Control
- Heavy flows in Attica Tollway Ramps & Kifisias Avenue especially during morning peak-hours (08:00-10:00)
- Extra congestion caused due to high flow, low speeds (businesses, shops, hospital) & illegal on-street parking
- Hence, the Traffic Police often regulates traffic

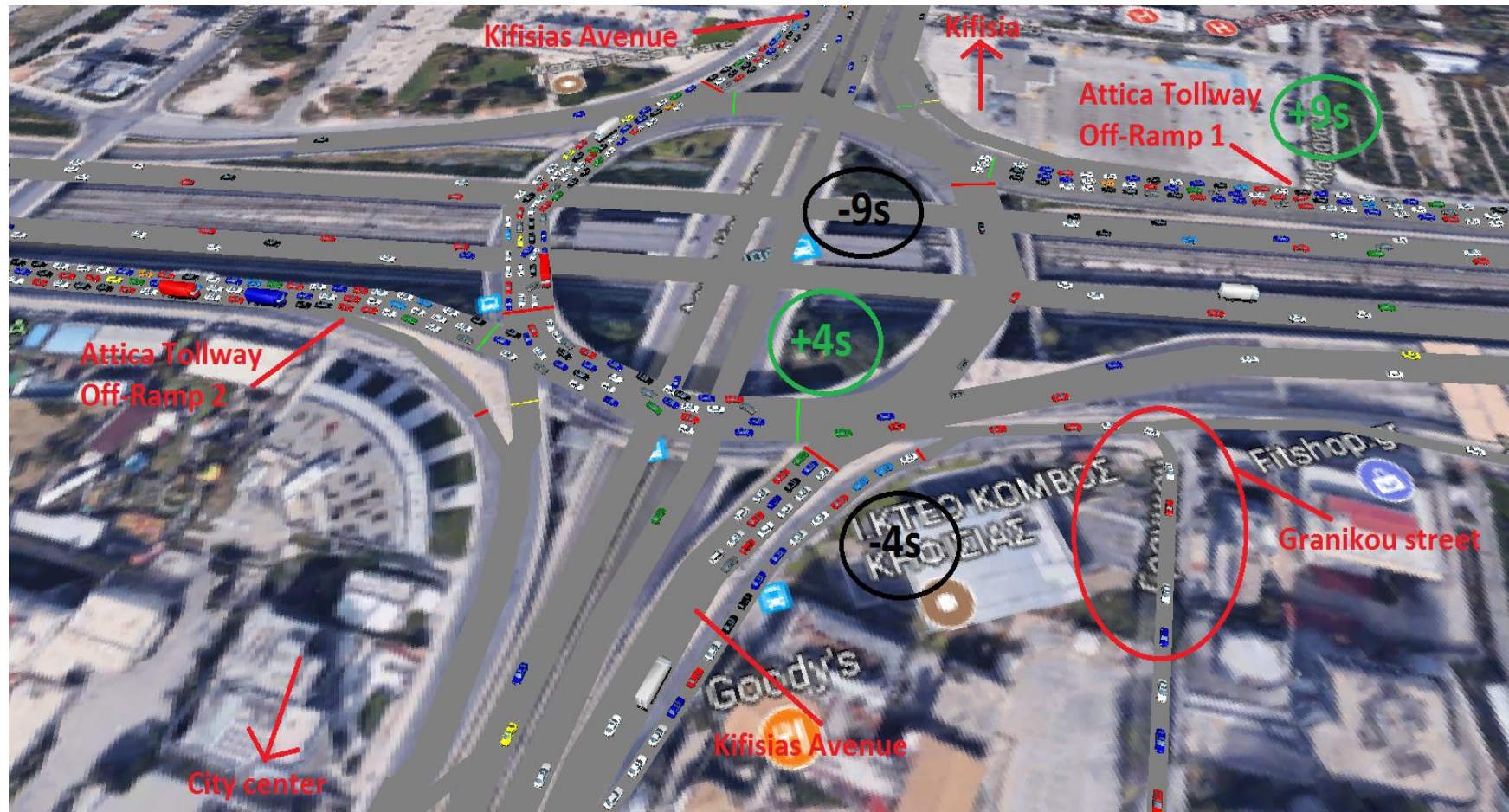
STUDY LOCATION



THE NUMBERS

- Signal Program SP1 (peak-hour) - Fixed-time (90s cycle)
28 Signal Groups (14 for vehicles & 14 for pedestrians)
- Attica Tollway observed flows
 - Off-Ramp 1 (3 lanes/20s) -> 3.050 veh/hour (peak-hour)
22.000 veh/day
 - Off-Ramp 2 (3 lanes/17s) -> 1.300 veh/hour (peak-hour)
16.000 veh/day
- Kifisias Avenue
 - Kifisia -> City center (4 lanes/32s) -> 1.700 veh/hour (peak-hour)
16.500 veh/day
 - City centre -> Kifisia (4 lanes/32s) -> 1.900 veh/hour (peak-hour)
24.100 veh/day

THE CHANGES



MICROSIMULATION ANALYSIS - VISSIM

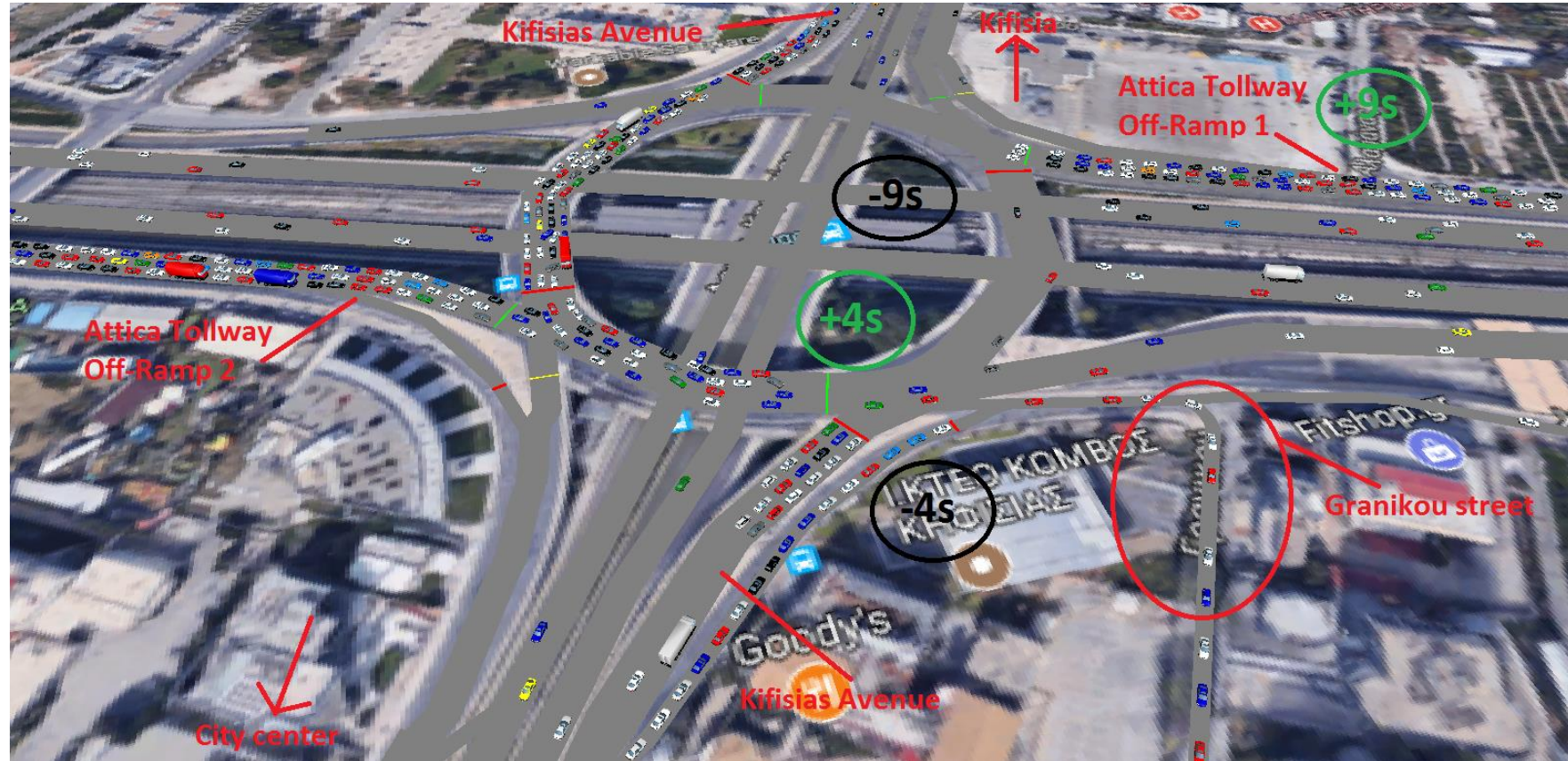
- Validation through comparison:
 - (1) observed traffic flows and
 - (2) observed travel times
- 2 simulated scenarios
 - (1) Before change in signal timings
 - (2) After change in signal timings
- 10 random number seeds per scenario (before and after)



MICROSIMULATION ANALYSIS - BEFORE



MICROSIMULATION ANALYSIS - AFTER





RESULTS

- Average Delay per vehicle (sec/veh)

	Kifisias Avenue			Attica Tollway		Roundabout			
	Kifisia -> City center	City center -> Kifisia	City center -> Granikou	Off-Ramp 1	Off-Ramp 2	southbound	westbound	northbound	eastbound
Before	16,7	24,2	41,4	187,9	199,6	8,4	4,3	4,4	56,8
After	16,8	27,6	68,7	26,6	44,6	5,7	4,4	5,0	36,2
% difference	1%	14%	66%	-86%	-78%	-32%	2%	14%	-36%

- Level of service

	Kifisias Avenue			Attica Tollway		Roundabout			
	Kifisia -> City center	City center -> Kifisia	City center -> Granikou	Off-Ramp 1	Off-Ramp 2	southbound	westbound	northbound	eastbound
Before	B	C	D	F	F	A	A	A	E
After	B	C	E	C	D	A	A	A	D



Thank you !

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