10th INTERNATIONAL CONGRESS ON TRANSPORTATION RESEARCH

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Assessment of the Pilot Operation of the Athens Great Walk

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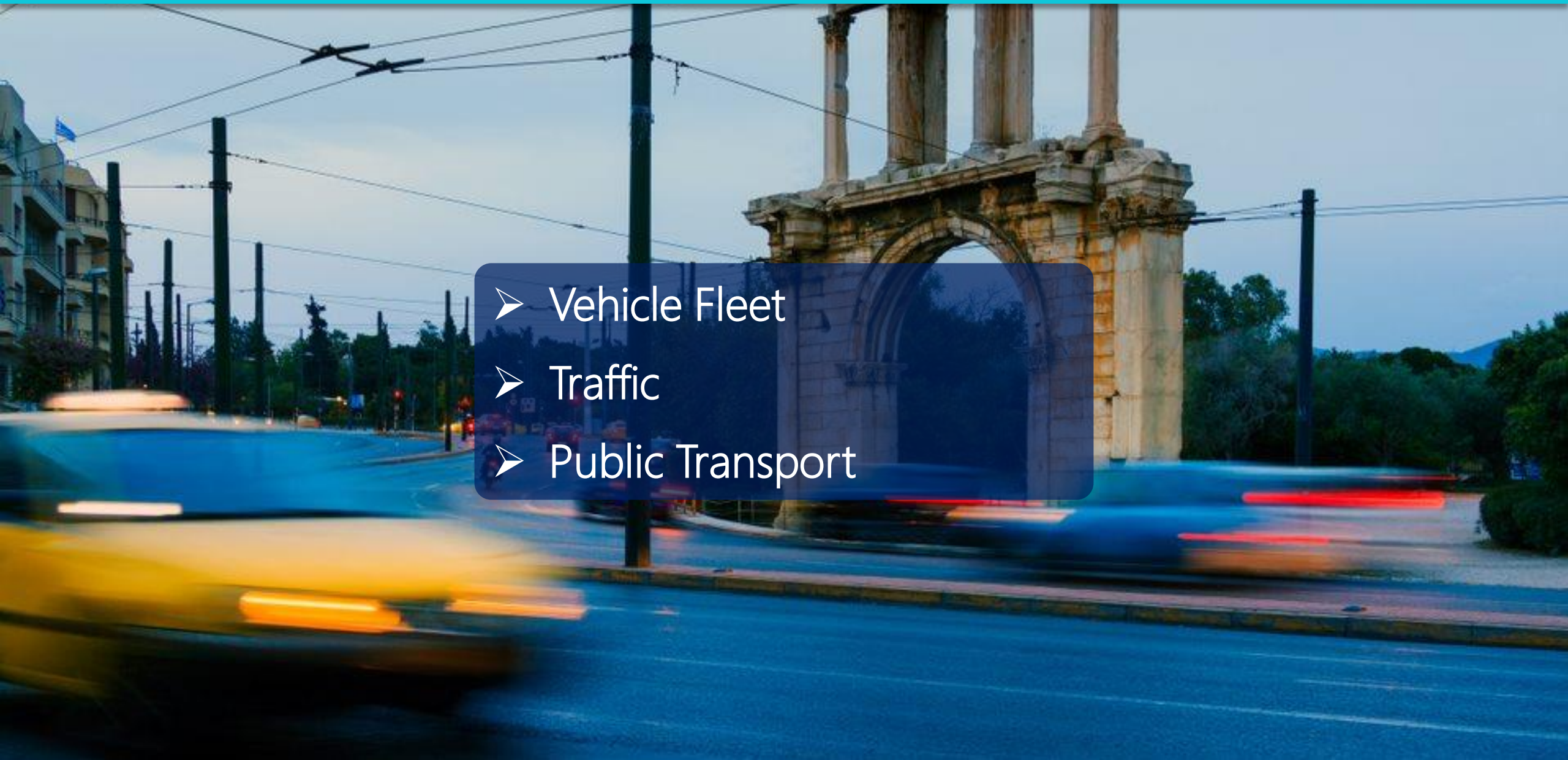
Outline

1. Mobility Situation in Athens
2. Framework & Aims
3. Assessment of the Pilot Operation
   - Traffic
   - Cycling
   - Parking
   - Walking
   - Modal Split
4. Overall Assessment

Current Mobility Situation in Athens

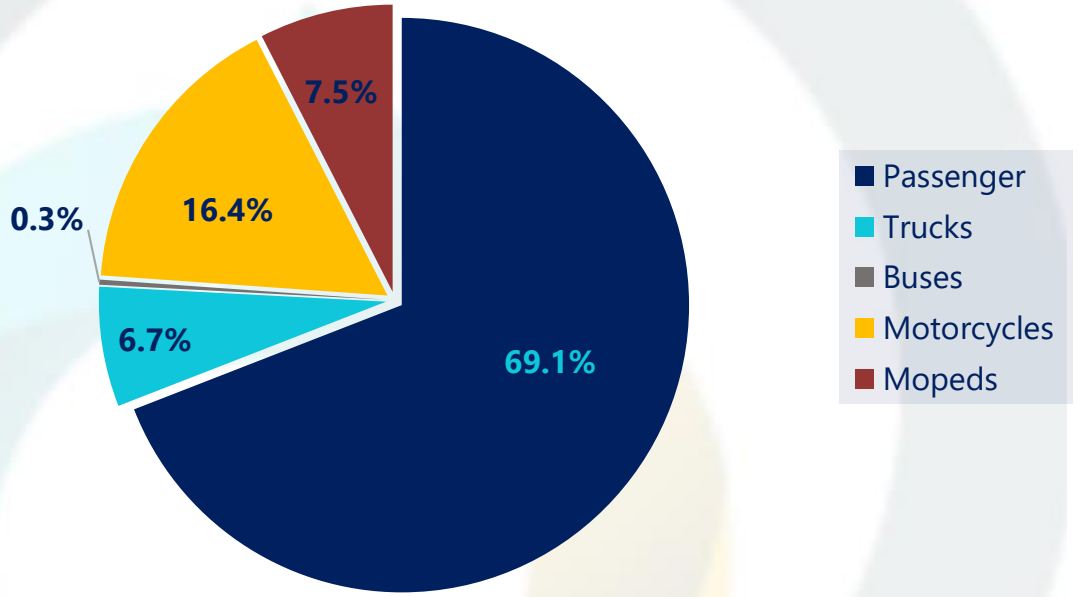


- Vehicle Fleet
- Traffic
- Public Transport

Vehicle Fleet

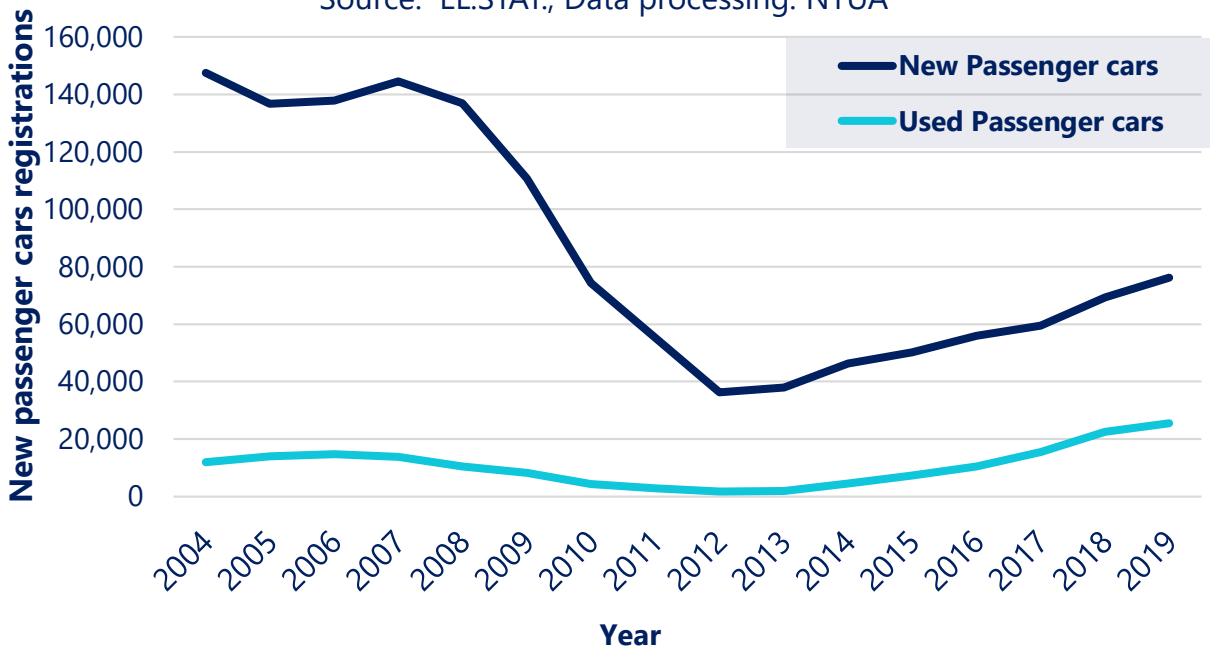
Vehicle fleet by transport mode

Source: EL.STAT., Data processing: NTUA



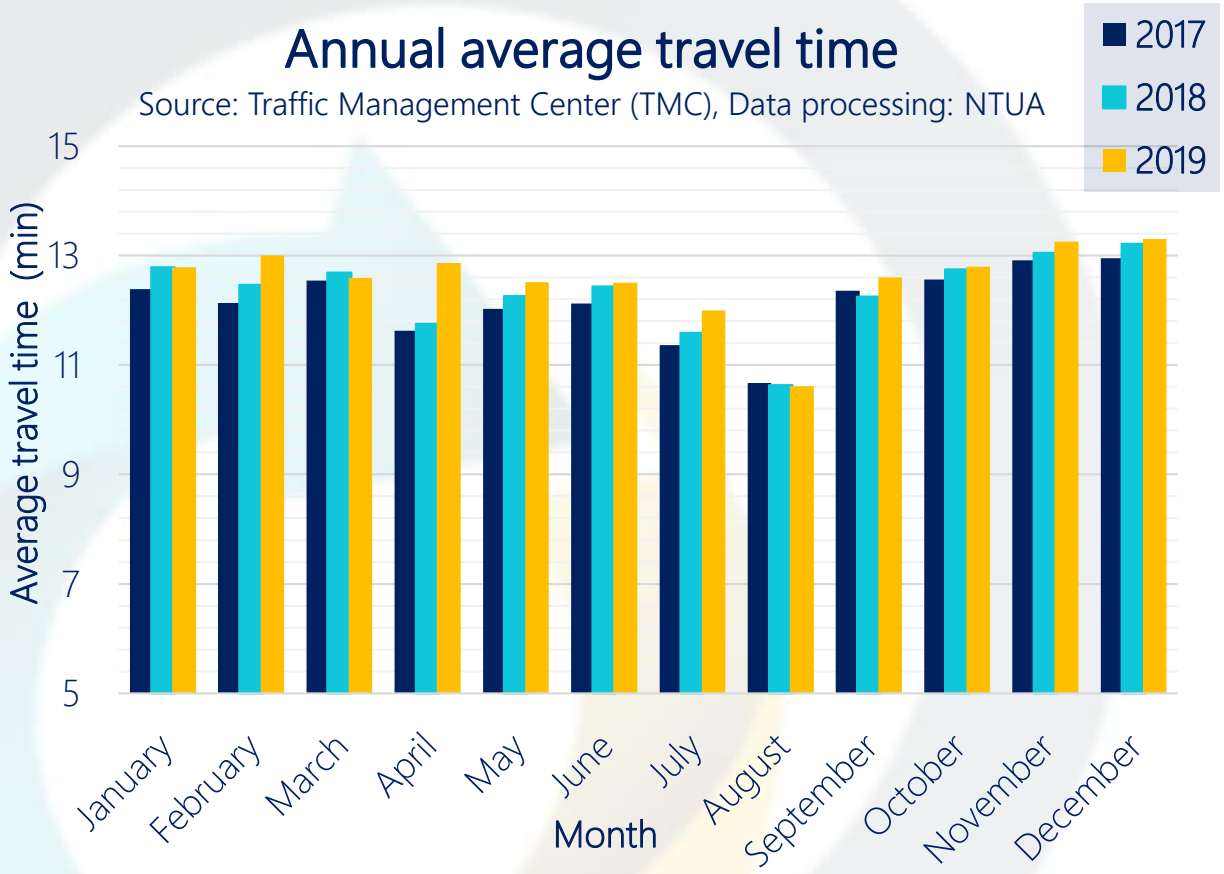
New passenger cars registrations

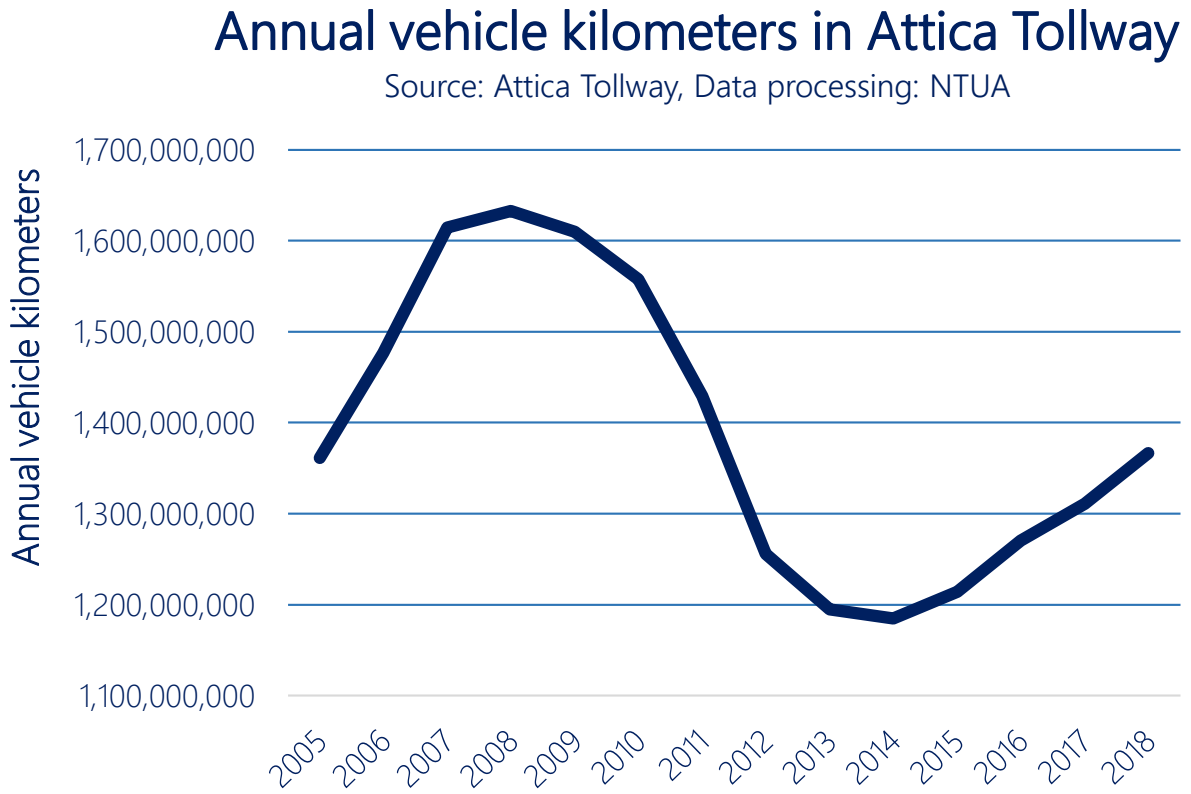
Source: EL.STAT., Data processing: NTUA



- Passenger cars constitute 69% of the total vehicle fleet, while two-wheelers constitute 24%
- There are approximately 14.000 taxis operating in Athens
- During 2009-2013, a reduction of new passenger cars and motorcycles registrations identified
- During 2019, Public Transport fleet consisted of 1.725 thermal and 291 electric buses
- Since early 2019, micromobility services are operating in Athens

Traffic



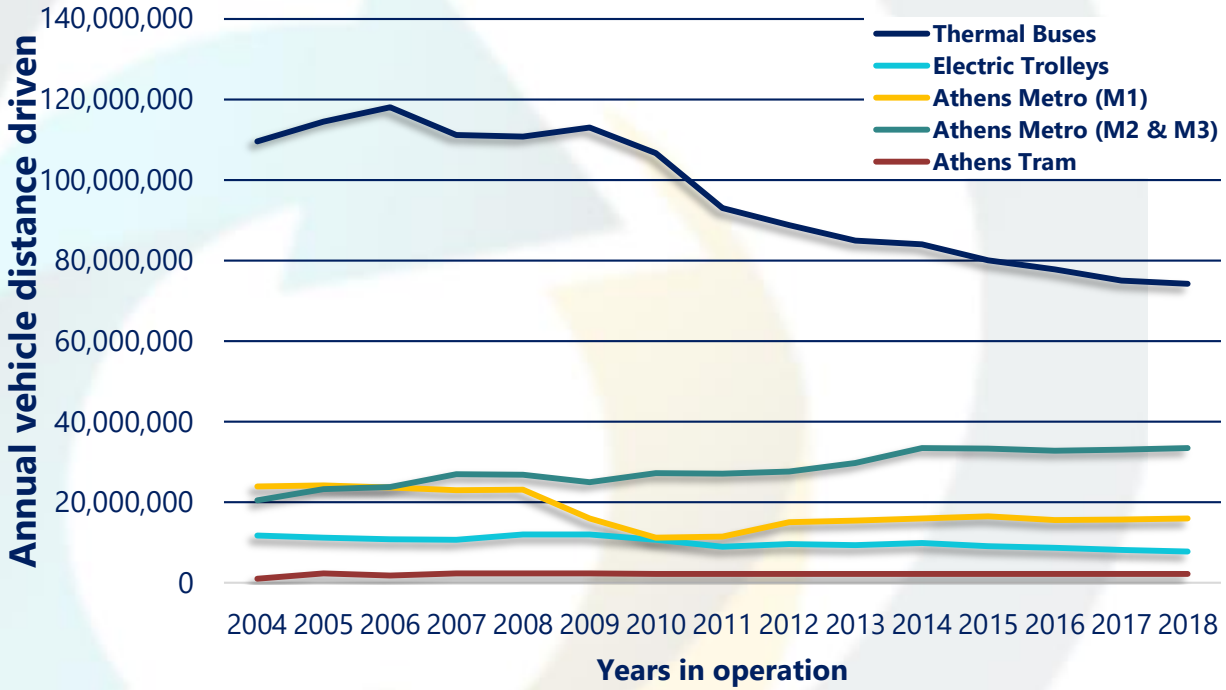


- The higher average travel time is in November and December, while the lower in August
- An increase in average travel time was identified in 2019, compared to the last three years
- A remarkable increase in annual vehicle kilometers in Attica Tollway was found during 2014-2018

Public Transport

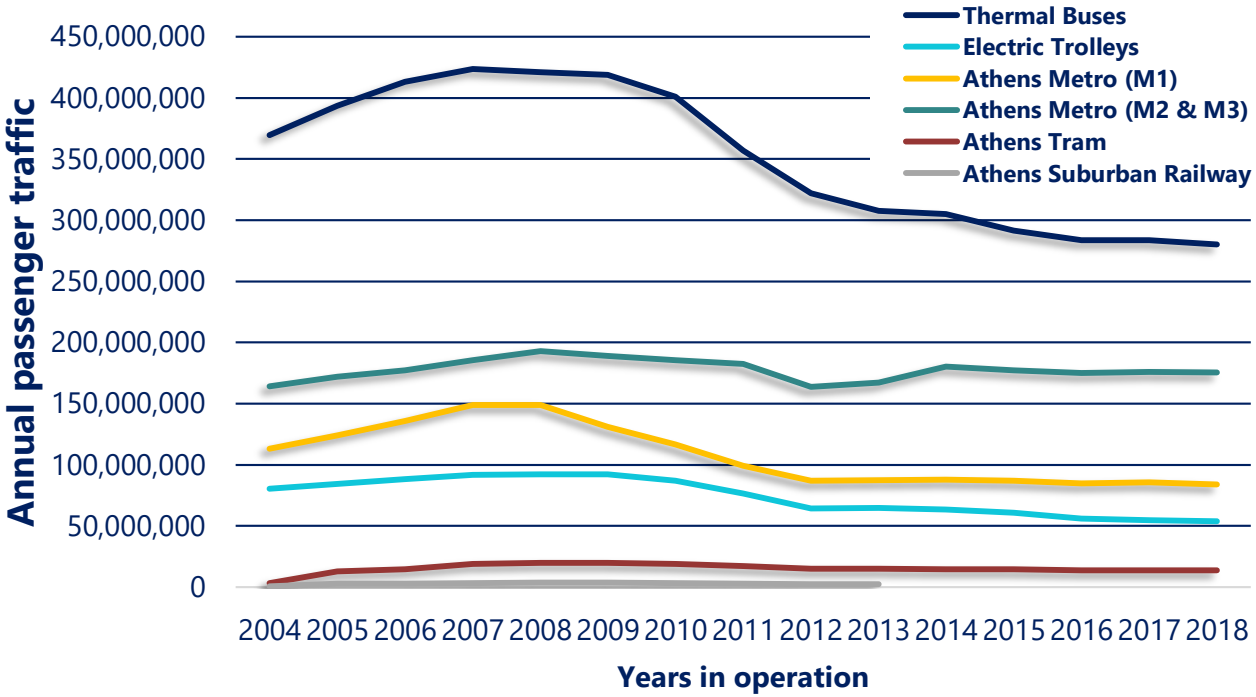
Evolution of annual vehicle distance driven of Mass Transit System

Source: OASA, Data processing: NTUA



Evolution of annual passenger traffic of Mass Transit System

Source: OASA, Data processing: NTUA



- Reduction of the number of passengers in buses, while vehicle kilometres of buses remained stable
- Reduction in vehicle kilometers of Athens Metro, while number of passengers remained stable

Framework & Aims
of Athens Great Walk Pilot Implementation

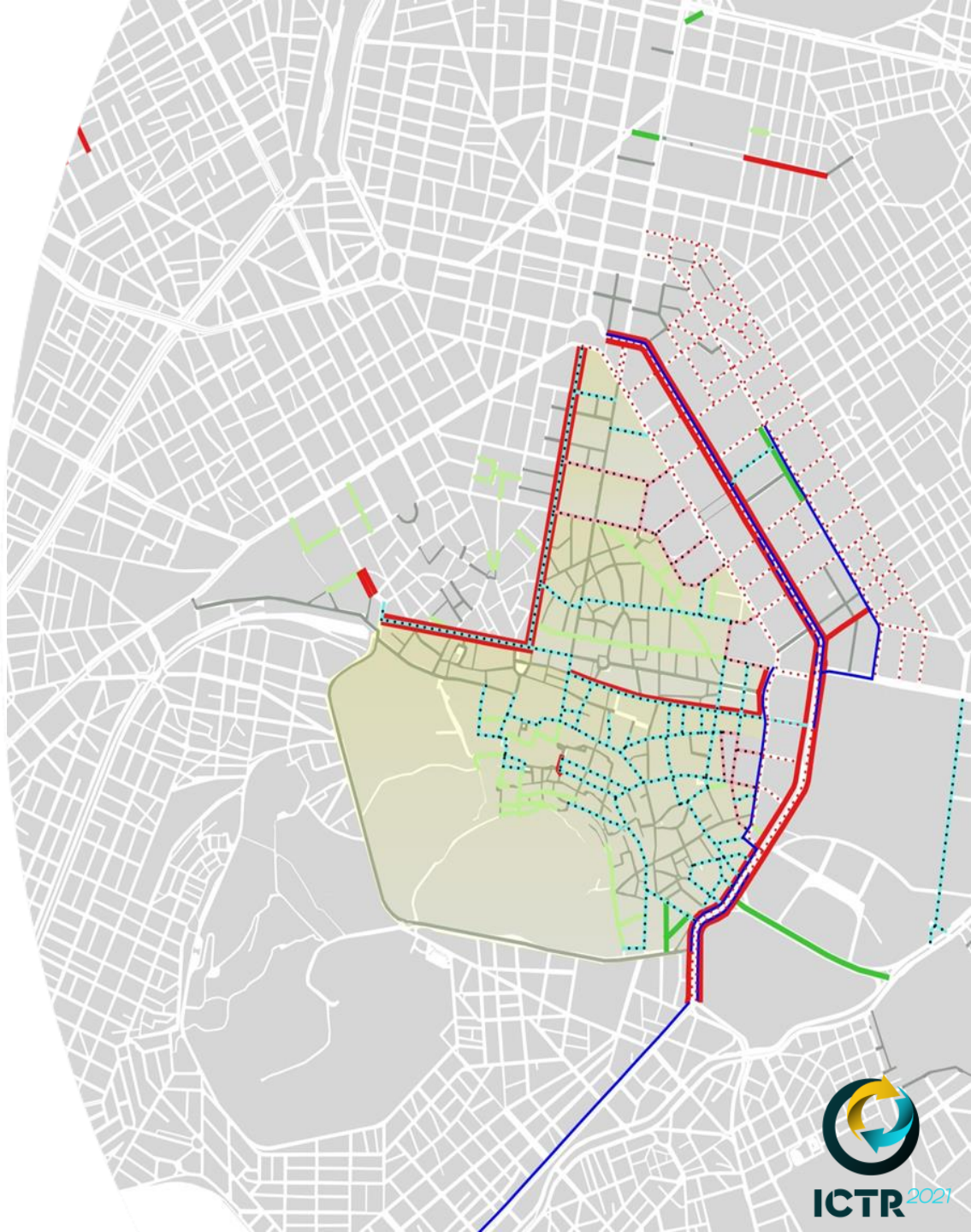
- The Athens Great Walk
- Pilot Implementation of mobility interventions
- Traffic Impact Study

The Athens Great Walk

- Since Autumn of 2019, within the framework of the new Sustainable Urban Mobility Plan of the City of Athens, a series of novel traffic and parking arrangements for the center of Athens were examined
- The objective of the new mobility interventions is to promote public transport and active travel modes, in order to achieve safe, green and efficient transport for all
- The new mobility interventions consist a major urban intervention called as the Athens Great Walk

Mobility Interventions

- Pedestrianisation
- Increase of Sidewalks in central road axes
- Streets free of passenger cars and motorcycles
- Areas free of passenger cars and motorcycles (Commercial Triangle, Plaka)
- Promotion of Public Transport and Cycling
- Speed Limit Reduction
- Improving Street Light Signaling
- Parking Policy



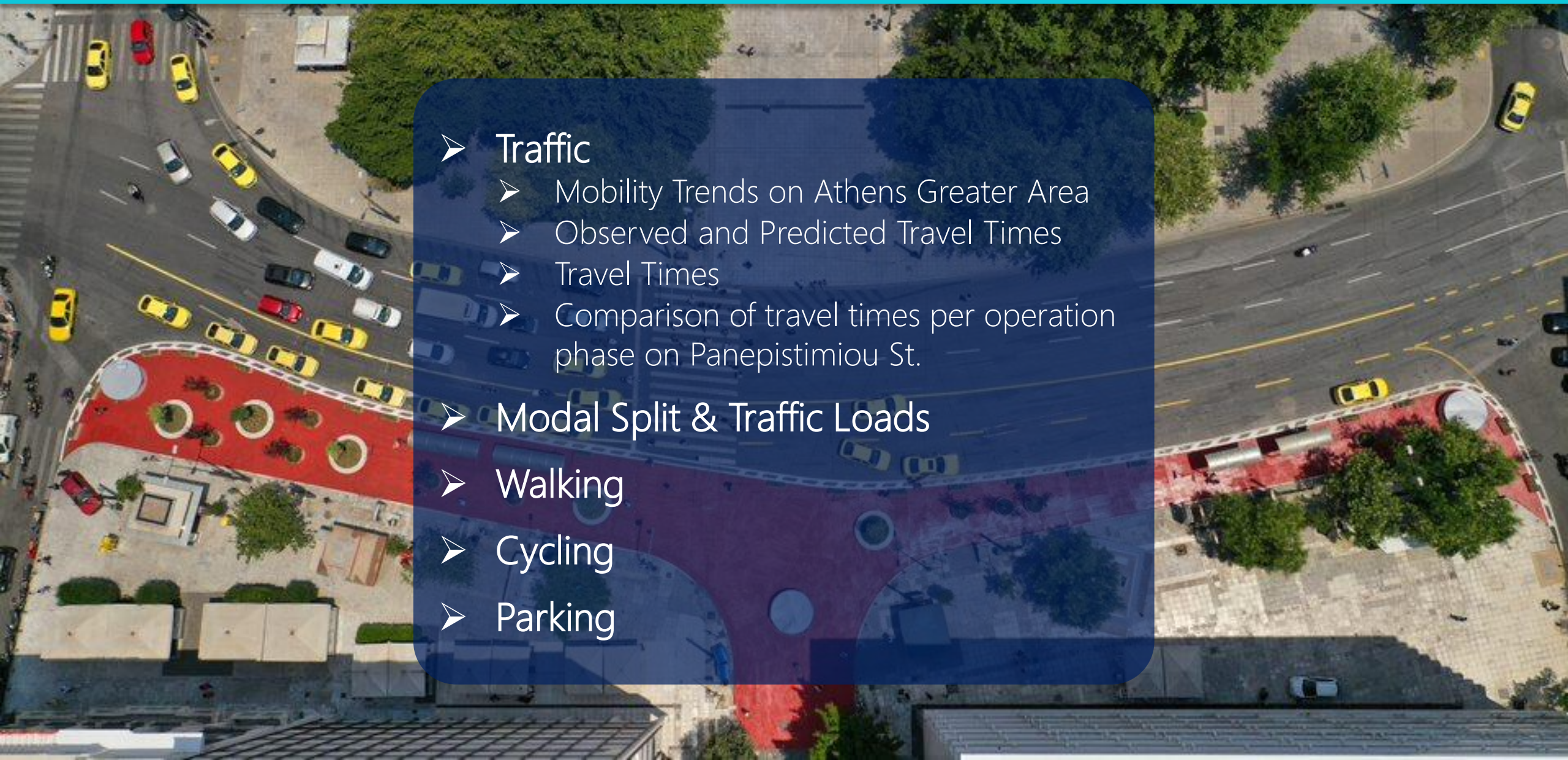
Pilot Implementation

- In June 2020, a pilot implementation of a subset of the new mobility interventions was decided, following the example of several cities worldwide on the occasion of the pandemic:
  - to support active travel modes,
  - to assess the mobility interventions in practice,
  - to initiate a live public consultation and dialogue based on pilot results
  - to guide travelers towards better mobility behaviour
- The subset of interventions implemented were:
  - Increase of sidewalks in streets with high pedestrian traffic
  - Exclusive lanes for pedestrians and cyclists
  - Exclusive bus lanes
  - Motorcycle, taxi and disabled parking management
- The evaluation of the pilot implementation led to useful adjustments for the final engineering

Traffic Impact Study

- Analysis of the current situation in the city of Athens and the Greater Athens area
- Examination of alternative traffic management schemes using the NTUA Traffic macro and micro simulation models for Athens (Aimsun)
- Calculation of Key Performance Indicators for car traffic, public transport, bicycles and pedestrians - Selection of the best scenario
- The model predictions were successfully validated during the implementation

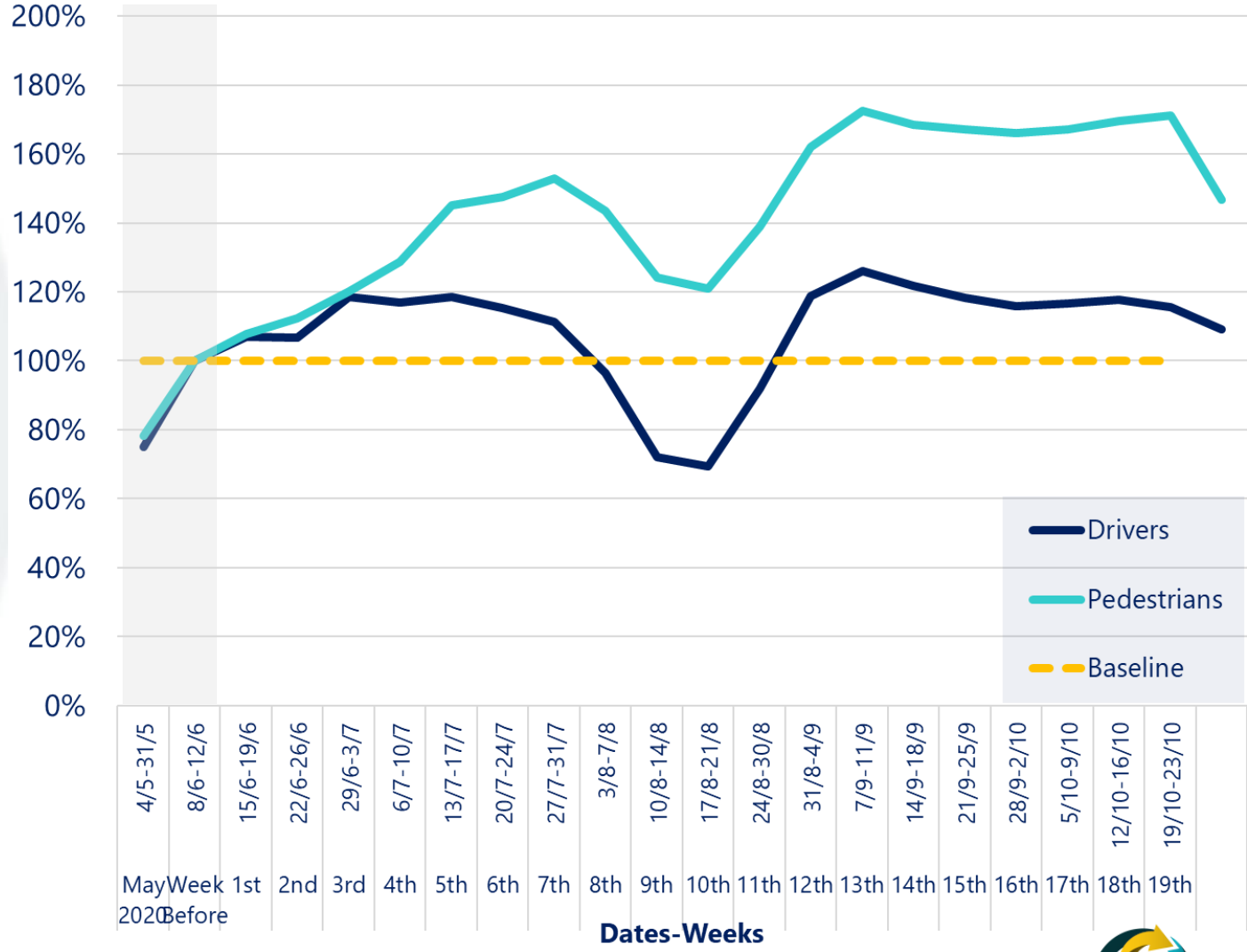
Pilot Assessment



- Traffic
  - Mobility Trends on Athens Greater Area
  - Observed and Predicted Travel Times
  - Travel Times
  - Comparison of travel times per operation phase on Panepistimiou St.
- Modal Split & Traffic Loads
- Walking
- Cycling
- Parking

Mobility Trends on Athens Greater Area

- Drivers mobility in May was reduced by an average of 20% compared to the week before the pilot implementation of the new traffic interventions (8/6/20-12/6/20)
- From June onwards, there was a significant increase in mobility, which may be partly due to the avoidance of Public Transport use due to the pandemic
- The week before the pilot implementation of the new traffic interventions is considered as the baseline time period



Source: Apple Maps

Comparison of Observed and Predicted Travel Times

- The observed travel times confirm the predictions of the traffic simulation model of NTUA, as presented in the relevant table (with an exception the Vas. Amalias Av.)

	Model Predictions			Observations			Difference
Route	**Existing A**	**Scenario 3 traffic lanes**	**Dif.**	**Before AGW**	**1st-7th week**	**Dif.**	**Observations - Predictions**
Central Road Axes							
Panepistimiou (from Vas. Sofias to Patision)	**2.9**	**5.1**	**2.2**	**2.7**	**3.9**	**1.2**	**-1.1**
Akadimias (from Patision to Vas.Sofias)	4.9	4.9	0.0	4.9	4.4	**-0.5**	-0.5
Solonos (from Vas. Sofias to Patision)	**4.4**	**5.1**	**0.7**	**7.1**	**7.2**	**0.1**	**-0.6**
Stadiou (from Aiolou to Vas. Georgiou)	3.3	3.7	0.4	2.7	2.6	**-0.1**	-0.5
Entry Road Axes							
Vas. Sofias (from Vas. Konstantinou to Panepistimiou)	**3.4**	**3.1**	**-0.4**	**4.6**	**4.4**	**-0.2**	**0.2**
Vas. Sofias (from Kifisias to Vas. Konstantinou)	5.5	5.0	-0.5	4.3	4.1	**-0.1**	0.4
Vas. Amalias (from Ath. Diakou to Panepistimiou)	**1.9**	**2.0**	**0.1**	**3.6**	**5.2**	**1.6**	**1.5**
Patision (from Alexandras to Stadiou)	2.7	2.6	-0.1	3.0	3.2	**0.1**	0.2
Exit Road Axes							
Vas. Sofias (from Panepistimiou to Vas. Konstantinou)	**4.4**	**4.9**	**0.5**	**5.2**	**4.4**	**-0.8**	**-1.3**
Vas. Sofias (from Vas. Konstantinou to Kifisias)	4.4	4.3	-0.1	5.7	5.2	**-0.5**	-0.4
Vas Amalias (from Filellinon to Ath. Diakou)	1.6	2.2	0.6	1.3	1.4	**0.1**	-0.5
Filellinon (from Vas. Georgiou to Vas. Amalias)	1.8	3.2	1.5	1.3	1.4	**0.1**	-1.4
Ring Road Axes							
Vas. Konstantinou (from Ardittou/ Ath. Diakou to Vas. Sofias)	**2.0**	**1.9**	**-0.1**	**6.7**	**7.0**	**0.2**	**0.3**
Vas. Konstantinou (from Vas. Sofias to Ardittou/ Ath. Diakou)	3.8	3.9	0.0	5.6	4.8	**-0.8**	-0.9
Alexandras (from Kifisias to Patision)	**9.0**	**9.6**	**0.5**	**7.8**	**9.0**	**1.2**	**0.6**
Alexandras (from Patision to Kifisias)	7.1	7.2	0.1	9.2	9.8	**0.7**	0.6

Travel Times

Central Road Axes

- Expected traffic congestion in Panepistimiou St. that stabilized after the 2nd week
- Increase of travel time on Panepistimiou St. by 48% in the first 2 weeks
- Limited traffic variation in the other central road axes

Entry Road Axes

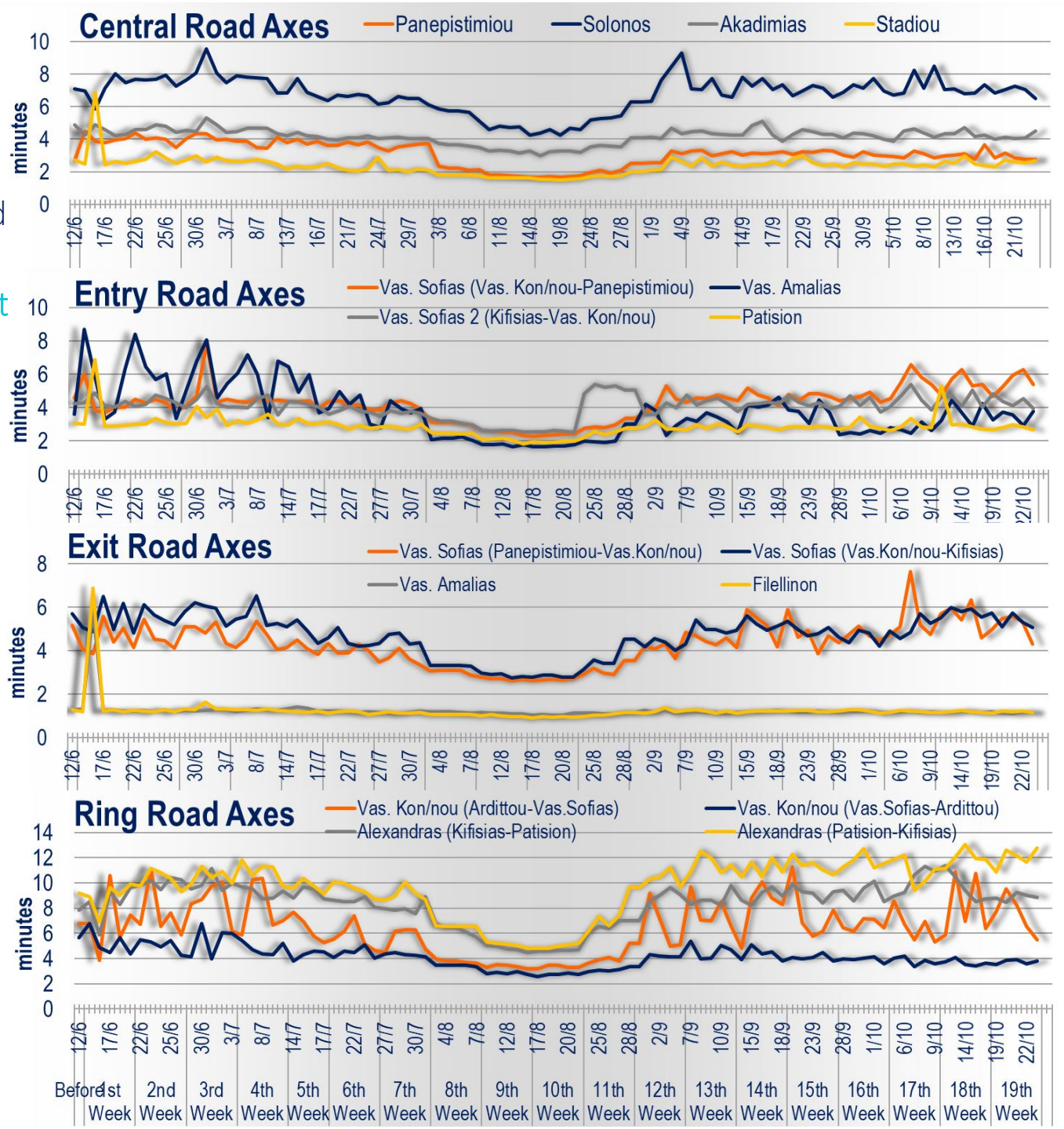
- Similar traffic conditions in the entry road axes comparing to the period before the pilot implementation
- Except from Vas. Amalias Av. (to Panepistimiou), which presents traffic congestion especially during the first operation phase (1st-7th week)

Exit Road Axes

- Travel times do not change significantly after the pilot implementation of interventions

Ring Road Axes

- Traffic congestion during the morning peak hours especially on the two routes of Alexandras Av.



Comparison of travel times per operation phase on Panepistimiou St.

1st operation Phase: 3 traffic lanes on Panepistimiou St.

2nd operation Phase: 4 traffic lanes on Panepistimiou St.

- The travel time on Panepistimiou St. during the 1st Phase increased by 1,1 min. while during the 2nd the traffic conditions were improved (+0,5 min.)
- Most of the entry road axes show similar traffic conditions to the period before, with the exception of Vas. Amalias (+1.6 min., 1st phase)
- The influence of the mobility interventions on the majority of the exit road axes is negligible
- Regarding the ring road axes, on Vas. Konstantinou Av. (to Vas. Sofias) and Alexandras Av. (to Kifissias) the travel times were increased during the 2nd phase

	Observations (min)			**Difference** (min)	
	Before AGW	**1st Phase**	**2nd Phase**	**Before AGW**	**Before AGW**
Route	**12/6/20**	**13/7-17/7/20**	**14/9-18/9/20**	**1st Phase**	**2nd Phase**
Central Road Axes					
Panepistimiou (from Vas. Sofias to Patision)	**2.7**	**3.8**	**3.1**	**1.1**	**0.5**
Akadimias (from Patision to Vas.Sofias)	4.9	4.2	4.5	-0.7	-0.4
Solonos (from Vas. Sofias to Patision)	**7.1**	**6.9**	**7.5**	**-0.2**	**0.4**
Stadiou (from Aiolou to Vas. Georgiou)	2.7	2.3	2.4	-0.4	-0.3
Entry Road Axes					
Vas. Sofias (from Vas. Konstantinou to Panepistimiou)	**4.6**	**4.2**	**4.6**	**-0.3**	**0.0**
Vas. Sofias (from Kifisias to Vas. Konstantinou)	4.3	4.2	4.2	-0.1	-0.1
Vas. Amalias (from Ath. Diakou to Panepistimiou)	**3.6**	**5.3**	**3.9**	**1.7**	**0.3**
Patision (from Alexandras to Stadiou)	3.0	3.0	2.8	0.0	-0.3
Exit Road Axes					
Vas. Sofias (from Panepistimiou to Vas. Konstantinou)	**5.2**	**4.1**	**5.0**	**-1.1**	**-0.2**
Vas. Sofias (from Vas. Konstantinou to Kifisias)	5.7	4.9	5.2	-0.8	-0.5
Vas Amalias (from Filellinon to Ath. Diakou)	1.3	1.3	1.2	0.0	-0.1
Filellinon (from Vas. Georgiou to Vas. Amalias)	1.3	1.2	1.2	-0.1	-0.1
Ring Road Axes					
Vas. Konstantinou (from Arditou/ Ath. Diakou to Vas. Sofias)	**6.7**	**6.2**	**8.1**	**-0.5**	**1.4**
Vas. Konstantinou (from Vas. Sofias to Arditou/ Ath. Diakou)	5.6	4.3	4.3	-1.3	-1.3
Alexandras (from Kifisias to Patision)	**7.8**	**9.0**	**8.9**	**1.1**	**1.1**
Alexandras (from Patision to Kifisias)	9.2	9.7	11.1	0.5	1.9

Source: Google Directions API

Modal Split & Traffic Loads

Panepistimiou St.

- Reduction of the hourly traffic load of passenger cars during the morning peak by 50% (from 2.522 to 1.259) and during the afternoon peak by 36% (from 1.710 to 1.094)
- Reduction of the share of passenger cars during the morning peak by 15%
- Simultaneous increase in the use of taxi by 7% and in the use of motorcycles by 9%

Nearby Area (Stadiou, Solonos, Filelinon, Vas. Sofias, Vas. Amalias & Akadimias)

- The modal split was slightly different from the period before the pilot implementation
- Reduction of the passenger cars share during the morning peak by 4% and during the afternoon peak by 2%
- Reduction of total hourly traffic load by 17% in the morning peak and 24% in the afternoon peak

Ring Road Axes (Alexandras Av., Vas. Konstantinou)

- The modal split did not show a significant difference compared to the period before

		Hourly Traffic Loads		Modal Split	
		Morning Peak Hour	Afternoon Peak Hour	Morning Peak Hour	Afternoon Peak Hour
Panepistimiou	Passenger Cars	-50,1%	-36,0%	-15,2%	-4,4%
	Taxi	2,5%	-27,2%	7,2%	1,4%
	Lorries	-78,6%	-70,0%	-0,9%	-0,7%
	Buses	-22,7%	15,8%	0,3%	1,2%
	Motorcycles	-7,0%	-24,2%	8,5%	1,9%
	Bicycles	-12,1%	60,0%	0,2%	0,4%
	Scooters	200%	280,0%	0,2%	0,3%
	Total	-33,3%	-29,6%		
Nearby Area	Passenger Cars	-23%	-28%	-4,1%	-2,3%
	Taxi	-7%	-17%	1,9%	1,7%
	Lorries	-16%	-57%	0,0%	-0,1%
	Buses	-15%	-13%	0,0%	0,2%
	Motorcycles	-10%	-23%	2,0%	0,4%
	Bicycles	-2%	-14%	0,1%	0,1%
	Scooters	-2%	143%	0,0%	0,1%
	Total	-17%	-24%		
Ring Road Axes	Passenger Cars	20%	14%	0,6%	-2,4%
	Taxi	13%	35%	-0,6%	1,7%
	Lorries	52%	116%	0,9%	2,0%
	Buses	33%	9%	0,1%	-0,0%
	Motorcycles	15%	16%	-0,9%	-1,0%
	Bicycles	-4%	-31%	-0,1%	-0,2%
	Scooters	64%	-61%	0,0%	-0,1%
	Total	18%	20%		

Walking

Panepistimiou St.

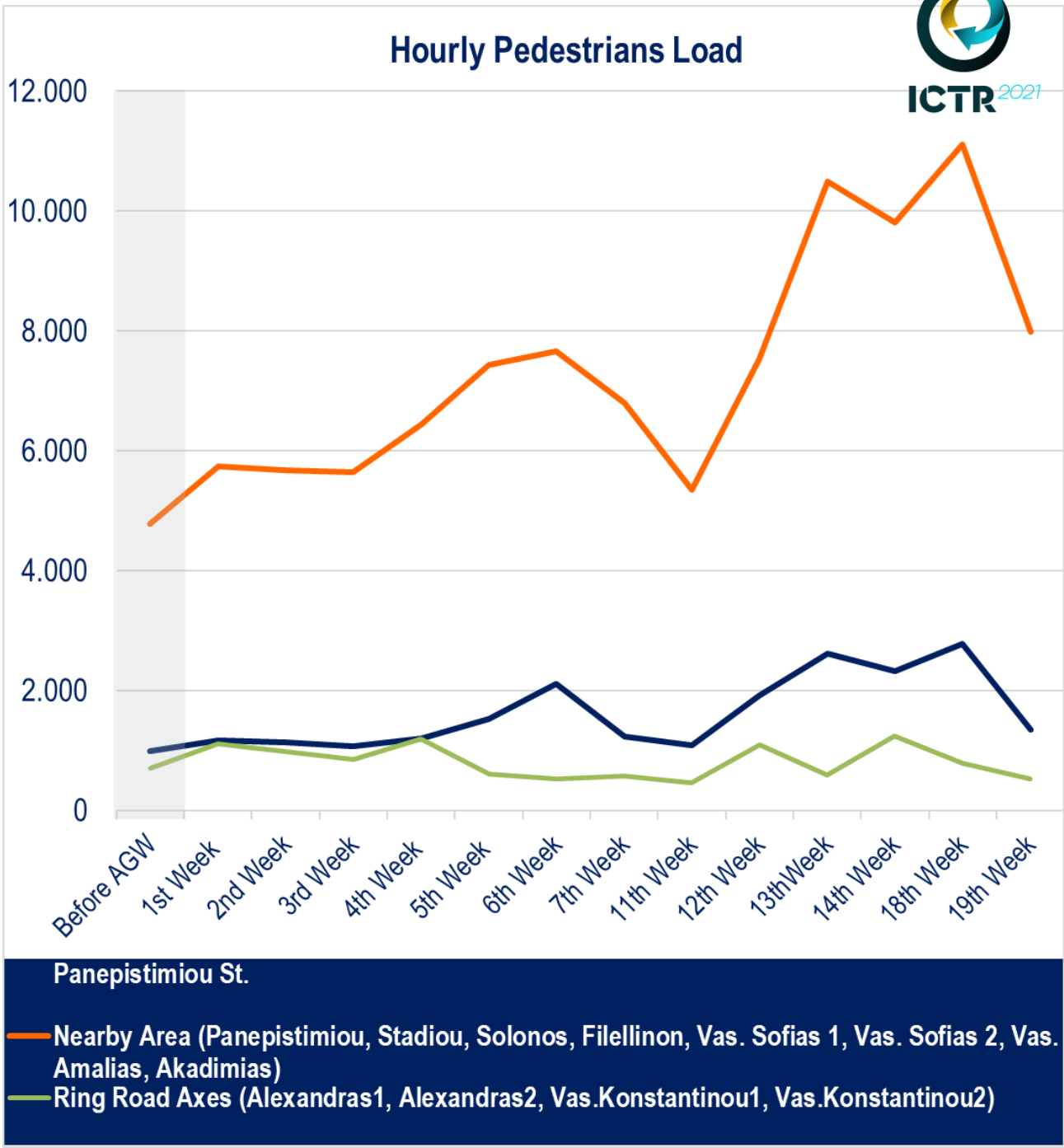
- Significant increase in walking by 98% compared to the week before the implementation of traffic interventions

Nearby Area

- Significant increase in walking by 82% compared to the week before the implementation of traffic interventions
- The increase can be attributed to the widening of the sidewalks on Panepistimiou St., Syntagma Sq. and Ermou St.

Ring Road Axes

- The increase in the Ring road axes is noticeable but lower than the other roads

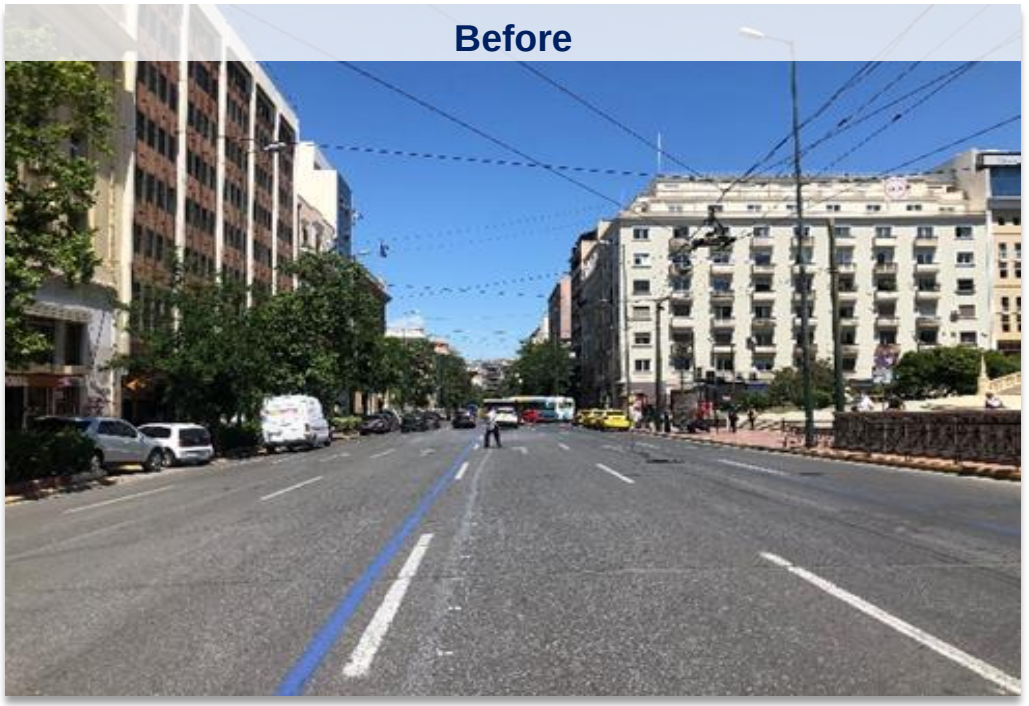


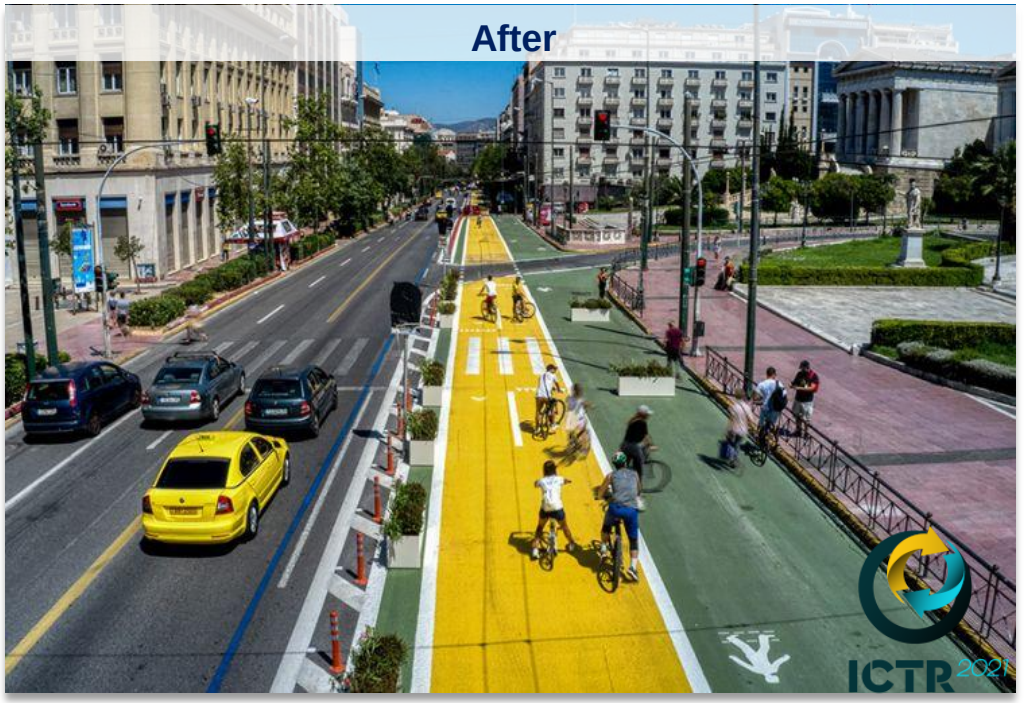
Cycling - Panepistimiou St.

- One of the purposes of the mobility interventions in the center of Athens, was to enhance sustainable mobility by using bicycles
- A special two-way traffic lane was created for bicycles on Panepistimiou St.
- There was an increase in bicycle mobility in the afternoon by 50% - 60%
- The highest bicycle load is observed in the 5th week (mid-July) of the examined period

Hourly Bicycle Load - Afternoon Peak														Average		
Before AGW	1st Week	2nd Week	3rd Week	4th Week	5th Week	6th Week	7th Week	11th Week	12th Week	13thWeek	14th Week	18th Week	19th Week	1st-7th Week	13th-19th week	Except from 11th &12th Week
10	8	2	2	0	44	34	24	10	12	16	14	16	8	**16**	**15**	**16**

	Difference (%)
Before AGW- Av. 1st-7th week	60%
Before AGW - Av. 13th -19th week	50%
Before AGW - Av. Except from 11th &12th Week	60%

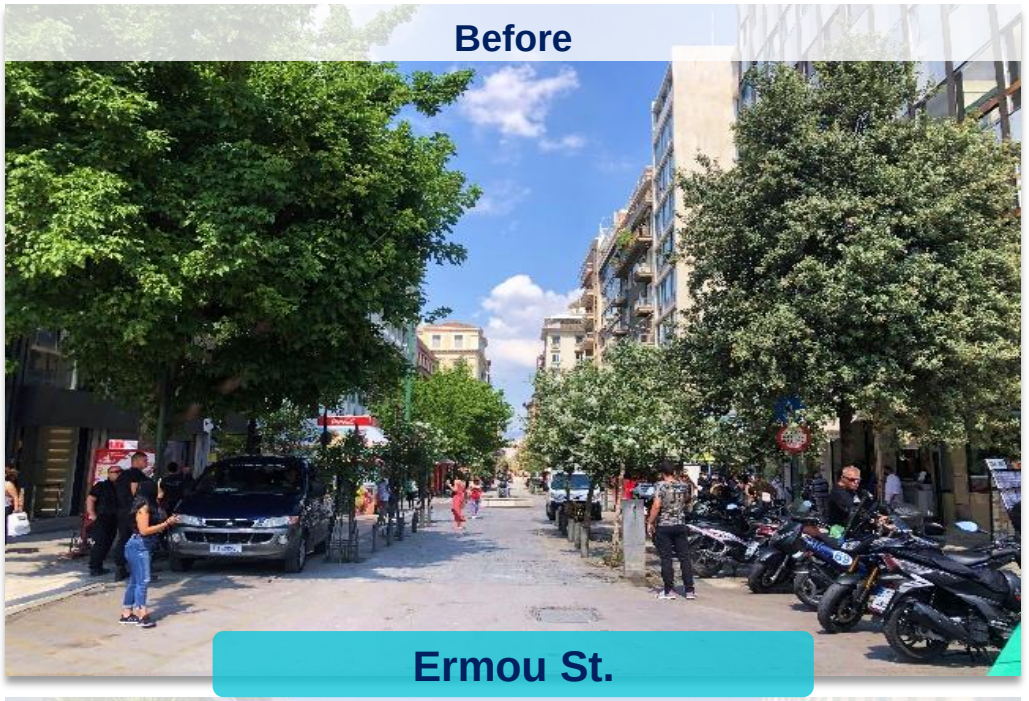


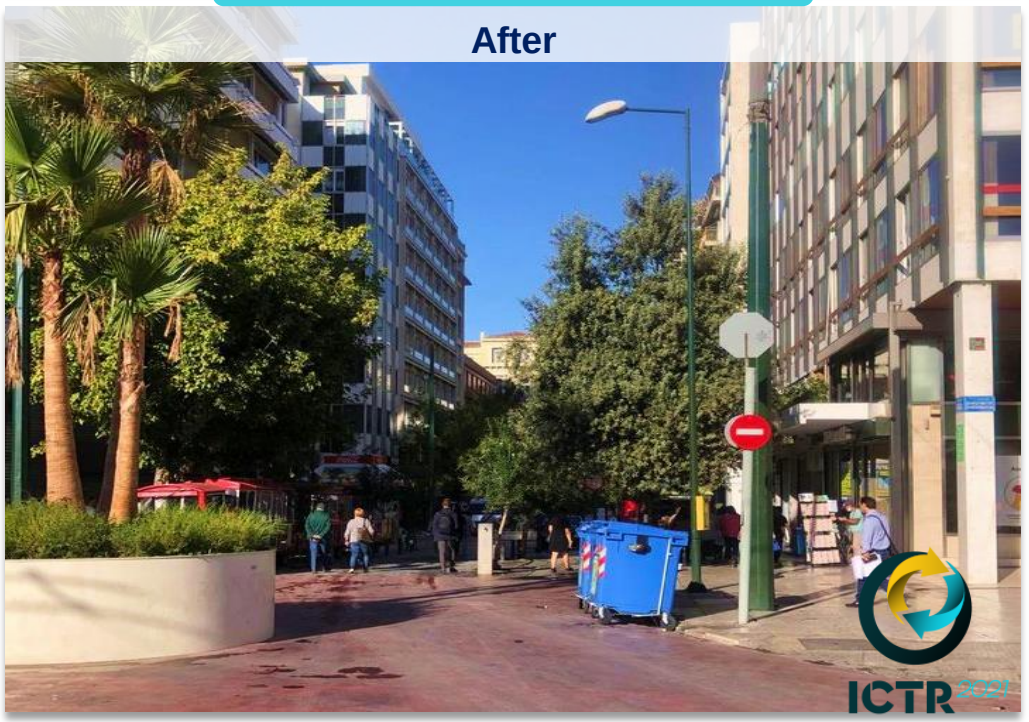


Motorcycles Parking

- To reduce the inconvenience of pedestrians from the illegal parking of motorcycles on the sidewalks, 919 new motorcycle parking spaces created on the road and it was observed:
  - Reduction of illegally parked motorcycles on the road and sidewalk, by 31% (from 1.744 to 1.205)
  - Regarding the legal parking spaces of motorcycles, there is an overall increase of 66% (from 775 to 1.289)

Area	Before		After		Difference (%)	
	Legal	Illegal	Legal	Illegal	Legal	Illegal
Commercial Triangle	408	1,043	889	669	+118%	-36%
Panepistimiou	63	92	96	52	+52%	-43%
Irodou Attikou	0	7	0	5	-	-29%
Psyri	250	244	250	210	0%	-14%
Plaka	54	358	54	269	0%	-25%
Total	**775**	**1,744**	**1.289**	**1.205**	**+66%**	**-31%**



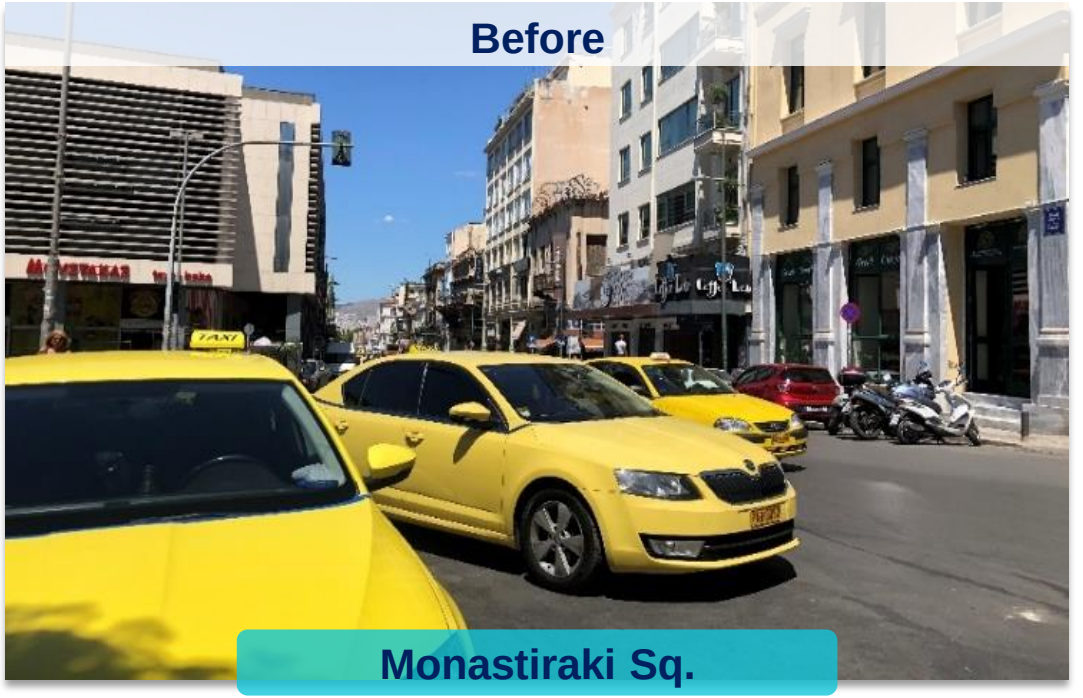


Taxi Stand

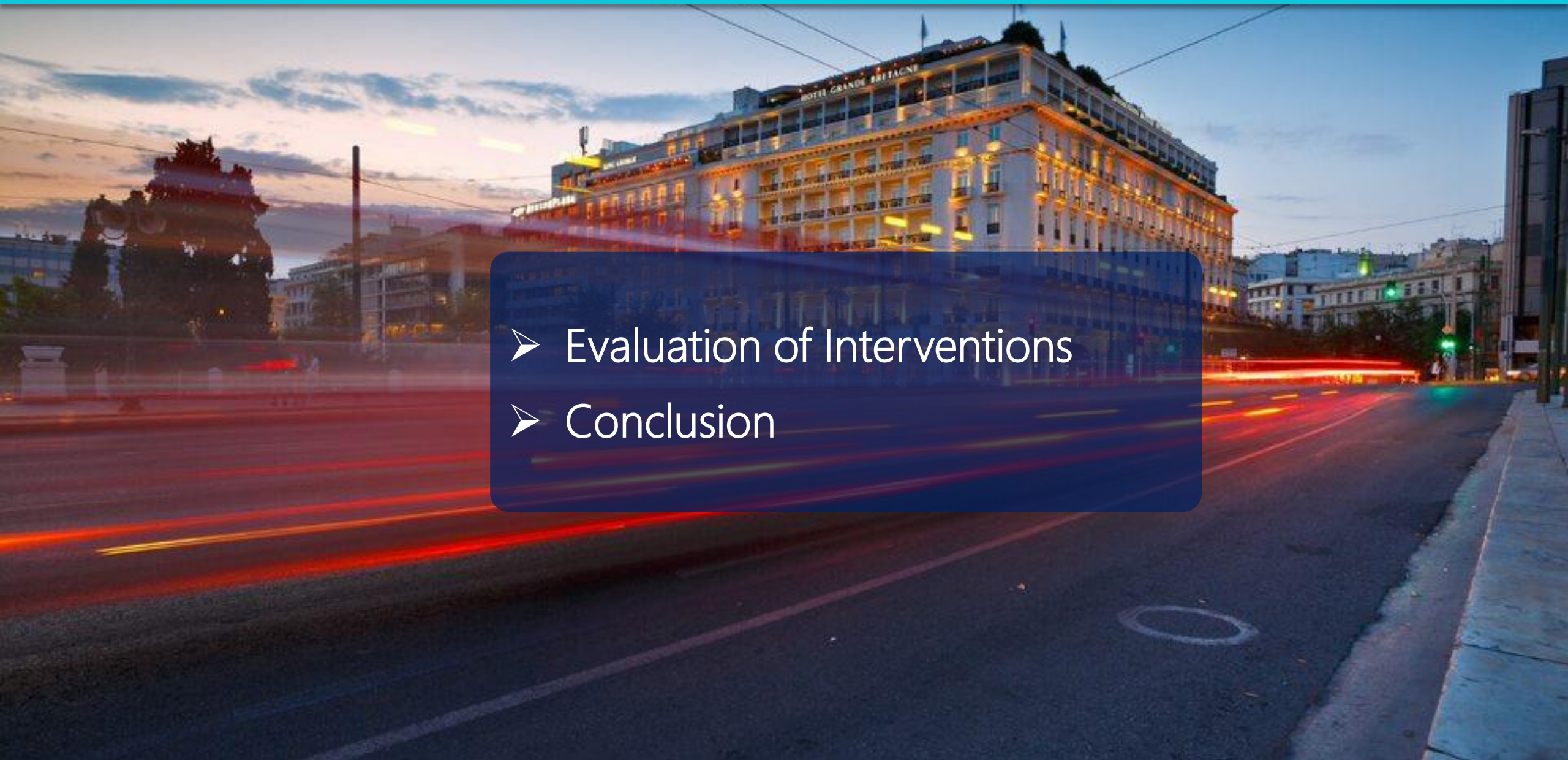
- By implementing the new mobility interventions in Athens center, taxi stands have doubled

	Before	After
Commercial Triangle		
Othonos (to Amalias Av.)	11	11
Dragatsiniou (to Stadiou)	2	2
Sofokleous (to Athinas)	0	5*
Evripidou (to Athinas)	0	5*
Omonoia (to G. Septemvriou)	3	3
Omonoia (to Stadiou)	3	3
Ag. Asomaton	0	3
Monastiraki Sq.	0	8
Total	**19**	**40**
Panepistimiou St.		
Omirou (to Panepistimiou)	0	3
Palama	4	4
Ippokratous (to Panepistimiou)	6	6
Sina (to Panepistimiou)	0	5*
Total	**10**	**18**
Grand Total	**29**	**58**

* final implementation is pending



Overall Assessment



- Evaluation of Interventions
- Conclusion

Evaluation of Interventions

Advantages

- Decrease of the passenger cars use on Panepistimiou St. (-15%) with a corresponding increase of taxis (+7%) and motorcycles (+9%)
- Improved Level of Service for bus and trolley passengers, as they do not have to get on/ off between taxis and other illegally parked vehicles
- Significant increase in walking on central Axes and in the area around the center of Athens
- Pedestrians on Ermou St. have more space so they can move more comfortably and more safely
- Increase in cycling in and around the city center
- Removal of illegally parked cars and taxis from bus roads, without provoking public reactions
- Better organized taxi stand by doubling the number of stand places
- Better parking service for people with disabilities by creating 17 new special parking spaces
- Reduction of car traffic speed on central roads with positive impact on safety and comfort of vulnerable road users
- Significant reduction of traffic noise and air pollution

Disadvantages

- Temporary (4 weeks) traffic congestion on a number of road axes in and around the city center such as:
  - Panepistimiou St.
  - Vas. Amalias Av.
  - Vas. Konstantinou Av.
  - Alexandras Av.
- Traffic conditions on the majority of the road axes significantly improved after 3 months, at similar levels as before the pilot implementation

Conclusion

- The goals and predictions of the new traffic and parking interventions in the context of Athens Great Walk, are implemented by relatively fast adaptation of mobility to the new traffic conditions
- For the first time, the focus on sustainable mobility policy is on people and the environment, in contrast to the unilateral priority in private car traffic
- There are already significant changes in the habits of the citizens by shifting to more environmentally friendly modes of transport
- These encouraging results provide an opportunity for the expansion of the new policy of sustainable urban mobility in all areas of the Municipality of Athens, aiming at the gradual implementation of an integrated network and bicycle lanes and more comfortable walking

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Assessment of the Pilot Operation of the Athens Great Walk

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Together with:
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