



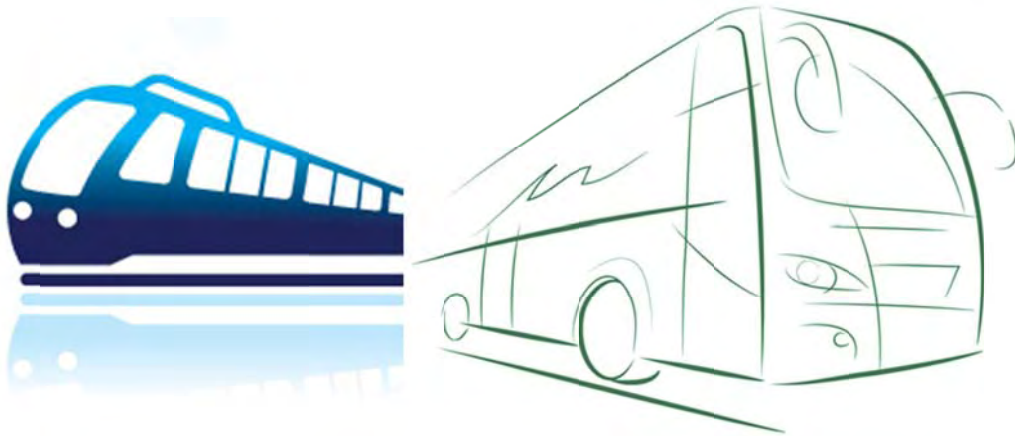
UNIVERSITY OF THESSALY

DEPARTMENT OF MECHANICAL ENGINEERING

TRACK OF PRODUCTION MANAGEMENT AND INDUSTRIAL ADMINISTRATION

FILIPPOS CHATZIOANNOU

**TRAIÑOSE AND KTEL
SYNCHRONIZATION STUDY**



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ABSTRACT

Modern's way of life requires a variety of means to transport people in the most effective way. This requirement leads to innovative policies where different means of transportation are combined and interact in order a viable and optimal usage of resources to be achieved. This increasing tendency is referred as co-modality and was introduced by the European Commission in 2006 to define an approach of the globality of the transport modes and of their combinations. It is, in fact, a co-operation among different existing transport modes. One such technique is the method of synchronization among different means, or even among different routes of the same mean of transportation, that results in decrease of passengers waiting time. To succeed it, we utilize a mixed-integer linear mathematical model with the objective of synchronizing the two main mass transport networks of Greece, the railway network (TRAINOSE) and the intercity bus network (KTEL), with the aim of minimizing the waiting time at intermediate transit nodes and thus facilitate co-modal transportation. The modeling involves an analysis of the effect of changing the schedule of railway operator, modifying the departure time from railway stations and keeping the departure time of KTEL intercity buses constant. Additionally, we analyze the modification of KTEL timetables by keeping the departure times of popular trips constant and modifying the departure time of less popular trips.

Keywords: co-modality, railway network, intercity bus network, waiting time minimization, transitional nodes

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1. PROBLEM DESCRIPTION

1.1 Introduction

Intercity transportations via public means of transport in Greece can be appeared using either the railway network or the intercity bus network. Greek railway network is called TRAINOSE's network, and intercity bus network is called KTEL, an abbreviation of "Kentriko Tameio Epaggelmaton Leoforion" (roughly translated into Central Union of Bus Operators). None of those networks contains all possible transitions from one place to another throughout the country. Therefore, in some cases, transition from train to bus, or reverse, is required. That can only occurs in stations of TRAINOSE and KTEL located nearby at the same place. Switching between different means of transport in order to complete a trip is referred to as co-modal travelling.

With the fact that travelling by public transport is quite more inexpensive than by private vehicles and offers a variety of comforts as well as because Greece is one of the most visited country around the world, TRAINOSE and KTEL are becoming increasingly popular. Although co-modal travelling is shown to be necessary in the Greek public transport network, the daily schedule of TRAINOSE and KTEL is not built to facilitate co-modality, but to meet high demand and local needs instead. More precisely, when increased demand was observed in a route, KTEL inserts additional coaches and TRAINOSE inserts additional railway cars in the same train route. However, this action does not solve the problem as passengers will still have the same (augmented in some cases) waiting time at intermediate nodes, since that kind of strategy does not take into consideration the necessity of a synchronized framework to improve co-modality.

1.2 Problem Solving

The aforementioned situation results in remaining long waiting time at intermediate stations and unoptimized network schedule. Taking into consideration the need to reduce the resulting waiting time of interchanges, we focused on synchronizing the timetables of TRAINOSE and KTEL. To achieve this, a synchronization mechanism was developed with basic purpose to minimize the waiting time between intermediate stations. Minimization was occurred taking first

CHAPTER 1: PROBLEM DESCRIPTION

into consideration the existing schedule. Then the existing schedule was adjusted to serve passengers offering the desired minimized waiting time.

In section 2 the Greek railway network (TRAINOSE network) will be described, listing all the nodes included and highlighting the transitional ones. Moreover, they will be presented information about the existing intercity bus network as well as the criteria to minimize the waiting time in our second case of this work.

Section 3 is the literature review, where previous research relevant to this one is presented, describing the progress that was made throughout the years on the subject of synchronizing public means of transport, and pointing out the differences from this work.

In Section 4 the mathematical model is presented, which consists of linear constraints and the objective function. This section also includes the assumptions made.

Section 5 includes all the data used in the model, as well as the results produced after applying the model. The optimal results are compared to the current timetables with the use of tables, showing the reduction of waiting time in every case.

Finally, Section 6 concludes the work and Section 7 is the appendix.

1.3 Conclusion

In the aforementioned paragraphs, both current situation and problem description were stated, so that the reader can recognize the solution that is presented below. However, before the development of solving process, it is necessary the current network to be clearly described. Therefore, below the form of the affected transportation network is analyzed.

2. NETWORK DESCRIPTION

2.1 Introduction

In this chapter the two main ways of Greek intercity transportation are described; the TRAINOSE network and KTEL network. Historical data as well as information about the transportation offered and the areas serviced by these two networks detailed below.

2.2 Railway network description

Greek's railway network history corresponds Modern Greek history. However, it was first met with its currently name, "OSE", about 40 years ago. It was established in 1970 and it is a public organization based in Athens. The current network amount to 2,265km, 80% of which is standard gauge (1,435mm), as is the standard in Europe and internationally (lines in operation, figure 1 below).



Figure 1: Rails

CHAPTER 2: NETWORK DESCRIPTION

In the figure below, lines with different speed limits are presented. We can observe that using the railway network our transportations are becoming faster, as the majority of lines offers speed limit of at least 80 km/h (percentage of speed limit in railway network, figure 2 below).

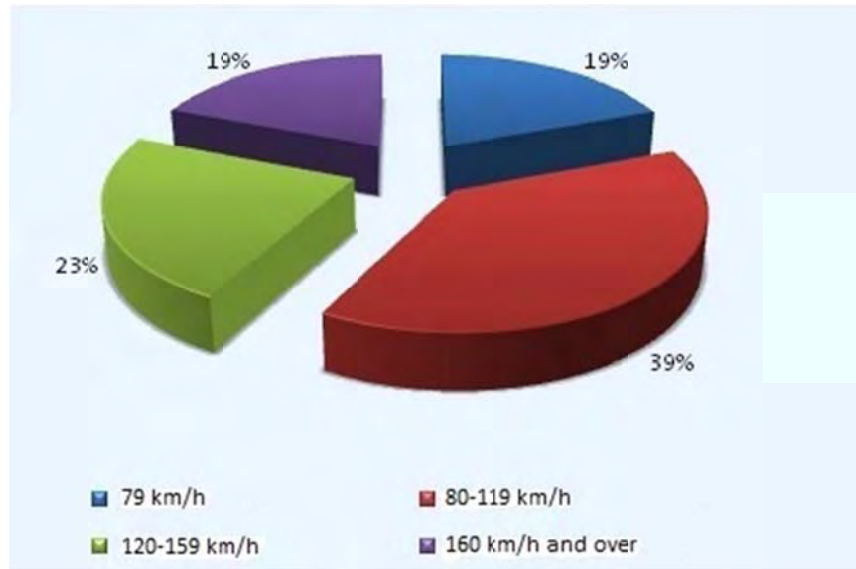


Figure 2: Sort lines based on speed limits

The Greek Railway Network consists of approximately 300 stations, where 30 of them are located in cities with both central railway and intercity bus stations. Therefore there are 30 intermediate nodes, as we named them for modeling presentation, that allow transition. The 300 nodes are forming 18 lines that are listed below in table 1.

1	Athens – Thessaloniki	10	Thessaloniki – Paleofarsalos
2	Athens – Alexandroupoli	11	Thessaloniki – Dikaia
3	Athens – Chalkida	12	Larissa – Volos
4	Athens – Kalampaka	13	Larissa – Kalampaka
5	Kalampaka – Paleofarsalos	14	Alexandroupoli – Dikaia
6	Thessaloniki – Larissa	15	Athens – Lianokladi
7	Thessaloniki – Kalampaka	16	Lianokladi – Stilida
8	Thessaloniki – Florina	17	Patra – Rio
9	Thessaloniki – Edessa	18	Kiato – Patra

Table 1: Railway Lines (round trips)

The list of all intermediate nodes is shown below in table 2.

1	Athens	16	Alexandria
2	Thiva	17	Veria

3	Livadeia	18	Naoussa
4	Paleofarsalos	19	Skidra
5	Larissa	20	Edessa
6	Katerini	21	Amintaio
7	Thessaloniki	22	Florina
8	Kilkis	23	Volos
9	Serres	24	Karditsa
10	Drama	25	Trikala
11	Xanthi	26	Kalampaka
12	Komotini	27	Lamia
13	Alexandroupoli	28	Chalkida
14	Didimoticho	29	Korinthos
15	Orestiada	30	Patra

Table 2: Intermediate nodes

Starting from the first occasion of our work, the train synchronization, each one of the 30 intermediate nodes that were shown above is destination and starting point of an intercity bus line. In addition to the intermediate nodes, KTEL has to serve a number of other bus stations, the arrival and departure time of which will play the main role in the synchronization process. Every intermediate node has its own timetable as part of the KTEL network, serving the local transportation needs, usually from a city to another or the nearby villages. KTEL network is considered to be invariable in our hypothesis of that first analysis, so its timetables that were used as data are shown in the appendix. Below, in figure 3 there is a visual representation of the railway network

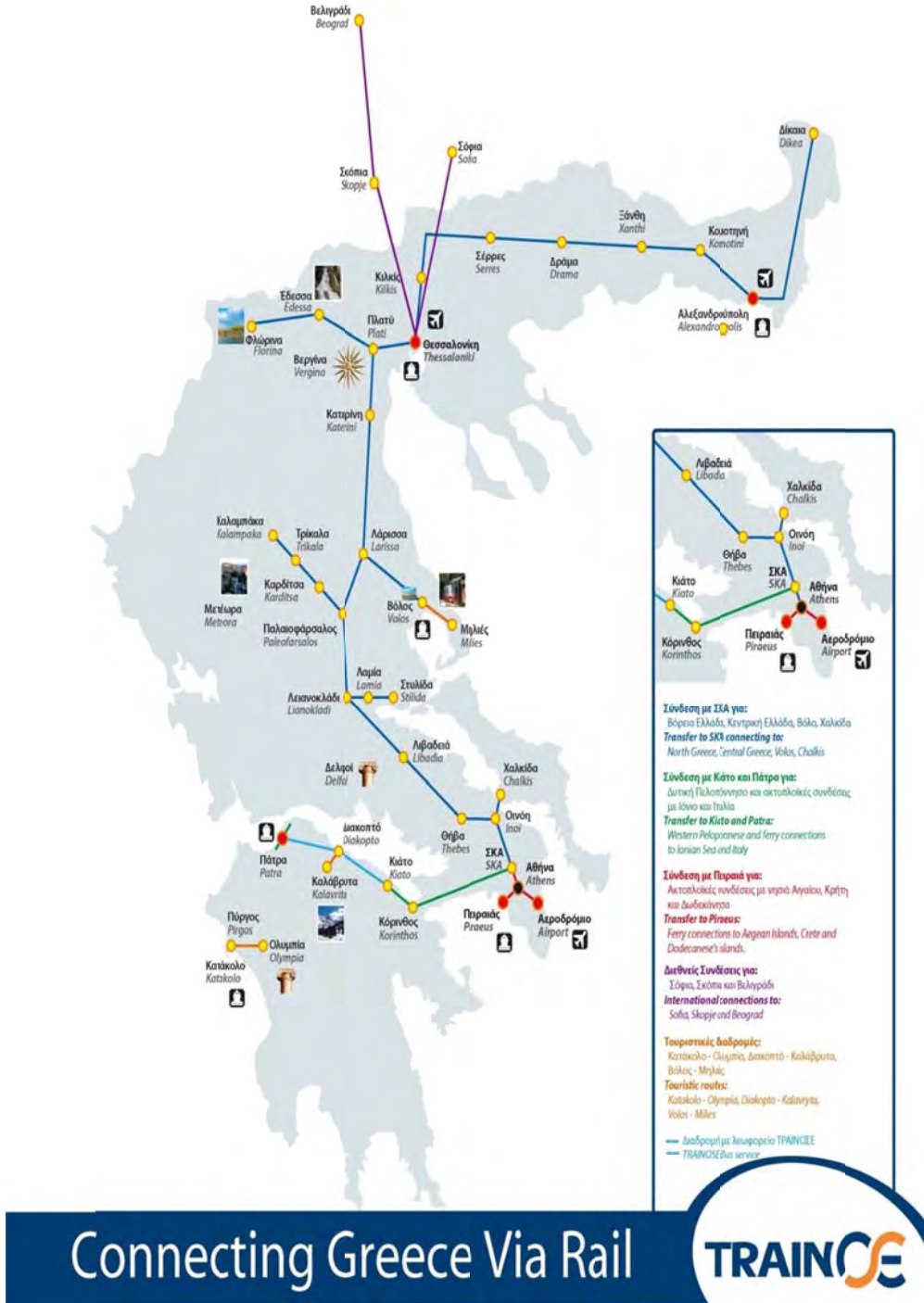


Figure 3: TRAINOSE Network, source www.trainose.gr

2.3 Intercity bus network

CHAPTER 2: NETWORK DESCRIPTION

Intercity bus network - or KTEL – is one of the most frequently used means of intercity public transportation and thus the most popular in Greece. This is because KTEL buses provide a network that satisfies the 80% of total passenger transportation around Greece. The whole network consists of 4,136 buses spread all over the Greece. In addition, KTEL buses offer their services in Greece since 1912, converting them into one safe and trustful choice for every transportation.

In this work, apart from the network used as data in train synchronization, there is an area in which optimization takes place in KTEL, too. The whole procedure is further described in next chapter. However in this section, we are about to describe the area and its stations and prefectures as well.

To begin with, the area that optimization takes place is central and south Greece. To be more precise, the places that are included in this work belong to “Peloponnissos” and “Sterea Ellada” departments. In fact, the contained KTEL routes for every prefecture of these departments are part of our optimization. In the figure 4 below “Sterea Ellada” is presented and we can see all the prefectures where the prefectures are optimized. The routes, destinations as well as stations will be further analyzed in next chapter.

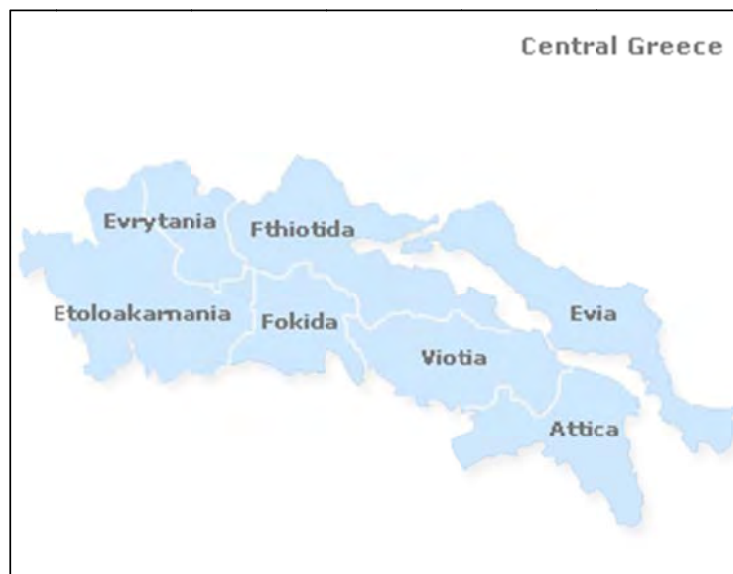


Figure 4: Prefectures Sterea Ellada

Not only Sterea Ellada, but also Peloponnissos is presented. The map in the figure 5 below shows the prefectures that are situated in that area with their capital cities marked and named.



Figure 5: Prefectures of Peloponnissos

This second analysis, referred to KTEL synchronization, is divided into two cases. The first one is KTEL synchronization between popular destinations and those less popular. This synchronization takes place in cities of south and central Greece in which train connections exist. The second one is KTEL synchronization between popular destinations and main train stations. This synchronization takes place in cities of south and central Greece where there is no train connection but there is a KTEL connection with Athens or Patra, where there is a central train station. Therefore, the second synchronization is occurred between KTEL routes and train routes with intermediate node the station of Athens or Patra. In this case, our hypothesis is that train timetables remain unchanged.

2.4 Conclusion

The last two parts of intercity networks description gave us precisely the area where optimization takes places. In addition, the characteristics of the two different means of transport were clearly stated. In the next chapter we will see some scientific reviews related to the problem of optimization. Similar cases of optimizing the transportation network are listed below.

3. LITERATURE REVIEW

3.1 Introduction

Research related to scheduling can be dated from the 1960s, when mathematical models developed to address two-way traffic on a single rail line (Frank, 1966). Since then various approaches have been developed to work on different affairs confronting train scheduling, and in general they can be categorized in three types: analytical, simulation and discrete optimization approaches (Abril et al., 2006). The analytical approach, quite beloved in the first years of train scheduling research, utilizes elementary models to evaluate the capacity of a rail line, train delay and cycle times through probabilistic or deterministic analysis of train dispatching patterns (e.g., Chen and Harker, 1990; Hallowell and Harker, 1996; Flier et al., 2009). Despite its simplicity, analytical models are not frequently applied because they can exclusively capture train operational features to a limit degree. As a result of this and also thanks to significant advances in computational power, recent research has mostly turned to simulation and optimization techniques, which allow greater flexibility to model details of train scheduling problems.

3.2 Scientific progress

These aforementioned techniques seem to be appeared for the very first time by Bussieck, Winter and Zimmermann (1997). In their survey they stated that a typical train schedule comprises suitable arrival and departure times for trains at each station. For a particular line these times (arrival and departure) occur with a specific frequency within the basic period T , as described in a line plan. Due to usage of the same railway network, consecutive events are subject to several constraints. In addition, according to their approach, a usual objective to estimate train schedules is the minimization of the waiting time of travellers. Waiting time is considered the amount of time between the arrival of the one line and the departure of the interchanging one minus the time occurred by passenger for changing platforms.

Another approach has been presented by Ceder et al. (2001) for generating timetables in a network of buses, where a new schedule was created to better synchronize its

CHAPTER 3: LITERATURE REVIEW

timetables. This is achieved by undertaking to maximize the number of concurrent bus arrivals at the intermediate nodes of the network, resulting in minimizing the waiting time of passengers. For that attempt, a heuristic algorithm was developed to solve the mixed integer linear problem in polynomial time.

An extension of what was previously stated has been made by Eranki (2004), where synchronization is redefined to express the arrival of two trips at the same node within a small time window instead of simultaneous arrivals. It is considered that each intermediate mode is bounded between a lower and an upper waiting time limit for passengers. Instead of concurrent arrivals, it is stated a time gap between them that does not exceed the required waiting time. The objective of this analysis is to achieve maximum number of simultaneous arrivals.

The last two models of Ceder and Eranki are quite similar to our model approach because the definition of waiting time is described as the difference between the departure time of the one route and the arrival time of the other one, both of which share the same transitional node and the planning horizon in which the departure times of the trains are set.

Another study by Ibarra-Rojas and Rios-Solis (2012) investigating the bus network of Monterrey in Mexico addresses a problem of maximal synchronization. On that case, the goal was to avoid bus clumping of different lines by favoring passenger transfers. Clumping refers to a group of two or more vehicles, such as buses or trains, which were scheduled to be evenly spaced running along the same route, instead running in the same location at the same time. To reach the goal stated above, they use the objective of maximizing the number of synchronizations. Considering flexibility of great importance in that case, because of stochastic parameters such as traffic or accidents, synchronizations are set within a time window.

Hall et al. (2001) conducted a study where the waiting time was implemented in the objective function as the difference between the arrival time of the one route and the departure time of the interchanging route in a transfer node of the bus network, called transfer delay. It also refers to “holding time” in transfer nodes that means releasing a bus later than its scheduled departure time in anticipation of late arrivals of the connecting bus. The main purpose is to optimize these holding times by using analytical models. This study is suitable for inner-city transit as it includes a stochastic approach, which is not effective enough for intercity transit, since the departure and arrival times could be assumed deterministic due to long distance trips. The similarity with our model is that it is considered only one transitional node in both formulations.

Goverde’s research (1998) also refers to synchronization control but for scheduled train services. He lays importance upon the possible delays that may occur in a railway network. In his thesis, a systematic mathematical model has been created in order to estimate all waiting

CHAPTER 3: LITERATURE REVIEW

times related with initial train departure delays. Then, synchronization control is required in order to avoid sizeable waiting times for transferring passengers who are about to lose a connection but as aftereffect limited waiting times for other passengers. In other words, waiting time is divided in primary and secondary, depending on the size of delay. Thus, the objective is the minimization of the total relative (generalized) passenger waiting time.

Another approach, developed by Chen and Wu (2012), sets constraints in order to describe the railway network which ensures a minimum waiting time at each station, as well as the scheduling of successive departing routes. More precisely, time needed for passenger transfers and included in travel time can vary. The authors attempt to evaluate this special part of travel time utilizing fuzzy set theory, because it cannot be measured reasonably by the existing deterministic mathematics models. Thus, a model for optimizing the initial schedule of railway network is developed. In this research, as well as in the one presented in our work, there is no consideration regarding the ability of a passenger to choose another route, instead of the first available.

In a study conducted by Reinhardt et al. (2013), related with synchronization in airport transportation, waiting time is approached using a mathematical model and the problem is solved using a simulated annealing heuristic algorithm. The objective is to serve the existing demand of passengers' transportation in the most efficient way, while minimizing the excess time passenger spend on their journey. There are constraints that define the time of arrival at a node as the departure time from a previous node plus the transit time between them, just alike our approach. This algorithm can be well utilized for dynamic scheduling.

Dynamic scheduling is the basic part of the study occurred by Barrera et al. (2013) too. In this study it is designed the optimization of train scheduling in relation to demand's changes. The author wants to solve this optimization by dividing the whole problem in four parts, with basic purpose the minimization of passenger average waiting time. Finally, the results and advantages of designing a timetable adapted to the dynamic demand instead of regular and a comparison between this innovative method of considering dynamic demand and linear solving methods are represented.

Another proposal was composed by Wong et al. (2008) and is related with timetable synchronization railway network. In accuracy, it is expressed the necessity, nowadays, for interchanging among different means of transportation. Thus, the basic purpose is gentle transfer from one to another line at an intermediate node. To accomplish this demanding task, a mixed-integer-programming (MIP) optimization model is used with aim to minimize the intermediate-node waiting times of the passengers. What is more, an innovative usage of binary variables is set to restrict interchanges only to the necessary ones, which means first available

train route according to the authors. In addition, the model is tested in different hours and operational parameters as well as in flexibility to investigate the amount of progress. The definition of the waiting time in this research differs from ours as it takes into consideration exclusively the availability of the next route, which means that passengers cannot choose their desired routes neglecting delay criteria.

3.3 The present work

This work presents a novel approach for timetabling, in which the center of the formulation is the minimization of waiting times at transitional nodes of the railway and bus networks. In contrast to previous references, the number of train routes is predetermined and remains unmodified, which is the most applicable and realistic approach for TRAINOSE company. The same situation is occurred in the case of KTEL synchronization because the aim is to synchronize the two main intercity transportation networks (railway and coaches or TRAINOSE and KTEL respectively), the timetables of one of them needed to remain unchanged while adjusting the other.

In our work there are two cases of invariable timetables. It was first decided that the intercity bus timetables would be the one not to change and considered as first case. Then, a second case was added where only some of intercity bus timetables stay invariable whereas the others do change. Train timetables do not participate in this case. Finally, a reverse option was applied (that is, keeping the railway timetable constant while rescheduling the intercity bus timetable) where KTEL timetables of cities without train connection will be adjusted to train routes of Athens or Patra.

3.4 Conclusion

All in all, other similar researches were mentioned in this chapter. It was also clearly stated that the purpose and the way of optimization in our work has some cases. This is important in order to understand the procedure described and followed below. In the next chapter, presentation and analysis of mathematical model that is utilized are described. What is more, for better understanding the optimization procedure, the contents of different cases that will be occurred are thoroughly explained below.

4. MODEL AND APPROACH

4.1 Introduction

The purpose of the mathematical model is first to optimize the schedule of TRAINOSE facilitating co-modal transportation. Next, the same way of optimization is applied in the schedule of central and south Greece, as stated above. Every station of each network is called node. The node where transition occurs is called intermediate node and is usually the capital city of a prefecture or rarely another city with central station.

4.2 Train model description

The model is built to optimize 3-node transitions at a time. The first node is the starting point, the second is the intermediate node where the transition occurs, and the third is the destination. The transition occurs only when the first two or the last two or even all the nodes (as in KTEL synchronization, it will be described below) belong to the same network, TRAINOSE or KTEL. In any other case, the transition does not make sense since it cannot be executed.

In the first case, the objective is to minimize the waiting time for transitions between train and intercity bus. Therefore, the bus routes between nodes that are also part of the railway network were ignored because they can be completely served by train. For instance, there are bus routes connecting Athens via Thessaloniki but they are not taken into consideration in our synchronization with TRAINOSE, because Athens – Thessaloniki is a route that can be accomplished using exclusively train.

Each railway line was studied separately and consists of 3 nodes, in order to narrow down the problem which was at first too big to optimize due to the size of data. Most TRAINOSE lines consist of more than three nodes; therefore a choice needed to be made regarding which 3 nodes would be kept and optimized. That choice was based on population and demand criteria. The three nodes of each line are the starting point, one middle point and the terminal station. At least one of them reacts as an intermediate node, being also part of the intercity bus network.

Neglecting the current TRAINOSE timetables, we started investigating fully relaxed problems for all the active lines of train. We found all bus routes that interchange with every node of each train line and cannot be replaced by train routes. After checking the remaining nodes of both networks for feasibility, we run the algorithm.

The code process took place in the laboratory of Production Management Department of University of Thessaly School of Engineering, located in the Department of Mechanical Engineering. The Computer that was used for code running has the above characteristics:

- Processor: Intel ® Pentium ® D CPU 3.00 GHZ
- RAM: 1.00 GB
- Software: Windows 7 Professional 32-bit

The optimization library that was used is CPLEX ILOG IBM in Microsoft Visual Studio 2010 C++.

After the results had been obtained, it was observed that the optimal solution was far from the current TRAINOSE schedule and such enormous changes are hard to be made. Despite of passenger transportation, TRAINOSE serves freight transportations around Greece. Moreover, parts of its network are still single rail. Therefore, TRAINOSE makes its own synchronization for optimizing its timetables to avoid traffic in its rails or, even worse, potential collisions. Scheduling of timetable is well considered and the proposed intervals were abandoned.

Instead, after careful consideration and a conversation with TRAINOSE engineers, bounds were set minimizing the deviation from the current schedule while also minimizing the total waiting time up to a feasible point.

Finally, there are three code versions for each line, with gradual relaxation. For the first version the bounds were set allowing each train departure to deviate up to 5 minutes from the current schedule (± 5 minutes from current departure time, it is referred to as 10 minute window). The second version allows a 30 minute window relaxation (deviation up to ± 15 minutes from current departure time) and the third version allows a 90 minute window relaxation (deviation up to ± 45 minutes from current departure time). For not being complicated, the three aforementioned code versions will be named from now on as case 1 (± 5 minutes deviation), case 2 (± 15 minutes deviation) and case 3 (± 45 minutes deviation).

4.3 Intercity bus model description

CHAPTER 4: MODEL AND APPROACH

After the aforementioned procedure, a KTEL synchronization investigation was developed referred to our work as second analysis. In this analysis, KTEL routes adjust to other KTEL routes that are considered to remain invariable (named first case in our work) while other adjust to current TRAINOSE timetable of specific stations of the area we focus on (named second case in our work). This synchronization occurs in a part of Greece which contains the whole area of “Peloponnisos” and “Sterea Ellada”, as previous stated.

The code that was developed for this procedure consists of five different versions with some relaxation and modifications. For the first version, there are no time limitations in departure time apart from those that keep the same number of routes per day and do not permit smaller time gaps between two consecutive routes than the existed ones. The second version permits only a 15-minute deviation from the current timetables (± 15 minutes from current departure time). The third version permits a 30-minute deviation from the current timetables (± 30 minutes from current departure time) and the fourth and fifth, 45 minutes and 60 minutes deviation (± 45 minutes and ± 60 minutes from current departure time respectively).

In the first case, we include prefectures of “Peloponnisos” and “Sterea Ellada” that has connection with train, and thus a full table of routes for every destination exists. The destinations are divided in two categories depending on the number of routes per day:

- the invariable category with more than four routes daily and,
- the adjusting category with up to four routes daily.

When all the destinations – or most of them – have more than or up to four routes, then the sum of all destinations is divided by two and the outcome is rounded up to the nearest integer. The resulted number is the number of destinations that will be kept unchanged, starting from the destination with the greatest number of routes and continuing to those with smaller number of routes. If some destinations have the same number of routes, then the selection is made by taking into consideration the population and thus the most populous places are kept unchanged. The tables below (see table 3 to table 7) show the routes that will remain unchanged and the synchronizing ones for every prefecture included in our study.

Voiotia-Thiva			
Constant routes		Synchronizing routes	
1	Athens	1	Asopia
2	Domvraina	2	Mavromati
3	Thespies	3	Panagia
4	Ksironomi	4	Lefktra

5	Erythres	5	Kapareli
6	Leontari	6	Plataies
		7	Neochoraki
		8	Kallithea
		9	Arma
		10	Dervenochoria
		11	Platanaki
		12	N. Kokkino
		13	Saranti

Table 3: Constant and synchronizing routes from/to Thiva

Fokida-Livadeia			
Constant routes		Synchronizing routes	
1	Athens	1	Davleia
2	Afmissa	2	Agios Georgios
3	Antikira	3	Agia Triada
4	Orchomenos	4	Agia Anna
		5	Kiriaki
		6	Koronia
		7	Akontio
		8	Agios Dimitrios
		9	Kastro

Table 4: Constant and synchronizing routes from/to Livadeia

Evoia			
Constant routes		Synchronizing routes	
1	Athens	1	Karistos
2	Psachna	2	Rovies
3	Aliveri	3	Oxilithos
4	Kimi	4	Gimno
5	Amarinthos	5	Istiaia
		6	Avlonari
		7	Chiliadou
		8	Thessaloniki
		9	Ioannina

	10	Patra
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Table 5: Constant and synchronizing routes from/to Chalkida

Fthiotida-Fokida		
Constant routes		Synchronizing routes
1	Athens	1 Karpenisi
2	Raches	2 Volos
		3 Fournas

Table 6: Constant and synchronizing routes from/to Lamia

Korinthia		
Constant routes		Synchronizing routes
1	Athens	1 Chiliomodi
2	Archaia Korinthos	2 Klenia
3	Derveni	3 Agios Vasileios
4	Mesogeia	4 Nemea
5	Xilokastro	5 Athikia
6	Solomos	6 Isthmia
7	Loutraki	7 Sofiko

Table 7: Constant and synchronizing routes from/to Korinthos

Second case, next, includes places that do not have any kind of train connection but have bus connection with Athens or Patra. In this case, the synchronization occurs between the KTEL and train routes with intermediate node the city of Athens or Patra and train routes remaining unchanged. The tables below (see table 8 and table 9) show the KTEL routes that are synchronized with the railway network of Patra and Athens respectively.

Patra		
Constant routes		Synchronizing routes
Railway network of Patra	1	Pyrgos
	2	Mesologgi
	3	Agrinio

Table 8: Constant and synchronizing routes from/to Patra

Athens		
--------	--	--

Constant routes	Synchronizing routes
Railway network of Athens	1 Tripoli
	2 Megalopoli
	3 Leonidio
	4 Astros
	5 Andritsaina
	6 Sparti
	7 KEEM
	8 Molaoi
	9 Gytheio
	10 Areopoli
	11 Neapoli
	12 Monemvasia
	13 Gerolimenas
	14 Kalamata
	15 Messini
	16 Pylos
	17 Koroni
	18 Garlalianoi
	19 Nafplio
	20 Kranidi
	21 Galatas

Table 9: Constant and synchronizing routes from/to Athens

4.5 Mathematical model description

The model that is described in this work includes both continuous and binary variables. The objective is the minimization of the total waiting time for all possible transitions at the intermediate nodes of each case. The total waiting time calculation only takes into consideration the waiting time of the first feasible transition, and not all the next. However, that does not mean that other transitions are infeasible.

Indices

i, j : Nodes of railway (TRAINOSE) or intercity bus network (KTEL)

k : Synchronizing network nodes only

CHAPTER 4: MODEL AND APPROACH

$n,m:$	Route serial number
$t :$	Railway connection indicator, equals to 0 between nodes 0 and 1, equals to 1 between nodes 1 and 2 etc.

Sets

$I :$	Set of total number of nodes
$K :$	Set of total number of common nodes (part of both TRAINOSE and KTEL network)
$Route_{i,k} :$	Set of total number of routes directly connecting i and k
$Route_{k,j} :$	Set of total number of routes directly connecting k and j
$Route_{i,j} :$	Set of total number of routes directly connecting i and j
$C :$	Set of total number of lines connecting sequential nodes of a railway line

Data

$\overline{T2K}_k :$	Necessary traveling time between bus and railway station of node k
$\overline{TRT}_{i,j,m} :$	Travel time from i to j in route m
$\overline{TT}_{i,j,m} :$	The same as above but is used to compute the departure time when arrival time is the result
$\overline{ST}_{i,j,m} :$	Lower bound of decision variable representing the departure time
$\overline{ET}_{i,j,m} :$	Upper bound of decision variable representing the departure time
$\overline{Route}_{i,j} :$	Total number of routes from i to j for a period of one week
$\overline{X}_{i,j} :$	Equals to 1 if a connection exists between i and j, equals to 0 if not
$\overline{T}_i :$	Equals to 1 if i belongs to a node of the synchronizing network , equals to 0 if not
$\overline{L}_{i,j} :$	Equals to 1 if i and j are both nodes of the synchronizing network, equals to 1 if i and j are both parts of the constant network, equals to 0 if i or j is not part of the synchronizing network and equals to 0 if i or j is not part of the constant network respectively. This matrix is critical in order to define if the transition from i to j should be taken into consideration and optimized. The role of this parameter is to avoid the case, transitions from KTEL node to KTEL node of the same operator and the case, transitions from TRAINOSE node to TRAINOSE node.

$\bar{G}_{i,j}$:	Equals to 1 if i and j are sequential nodes of a specific synchronizing line, to define the time difference between sequential departures from the same node of the same synchronizing line. Using this parameter, we avoid that two routes depart from the same node i are about to travel to the same node j at exactly the same time.
\overline{GAP} :	The time difference between sequential departures of the same node and line (for railway nodes only).
$\bar{O}_{i,j,t}$:	Equals to 1 if nodes i and j with connection indicator t , are sequential nodes of a TRAINOSE line; equals to 0 if not. The parameter is used since the departure time of each intermediate node of a railway line is directly related to all previous departures.
\overline{BigM} :	A very big number
\bar{m} :	A very small number

Decision variables

$DT_{i,j,m}$:	Continuous variable, expresses the departure time from i to j on route m of intercity bus (KTEL) or train schedule.
$Y_{i,k,j,m,n}$:	Binary variable, equals to 1 if the optimized departure times allow transition from k to j on route n , under the condition that route m was decided to be used for the transition from i to k . Equals to 0, if not.
$WT_{i,k,j,m,n}$:	Continuous variable; expresses the waiting time on transition node k , visited by a passenger that arrives from node i of route m and travels to node j as final destination, by taking route n .

Table 10: Name of indices, sets, data and decision variables

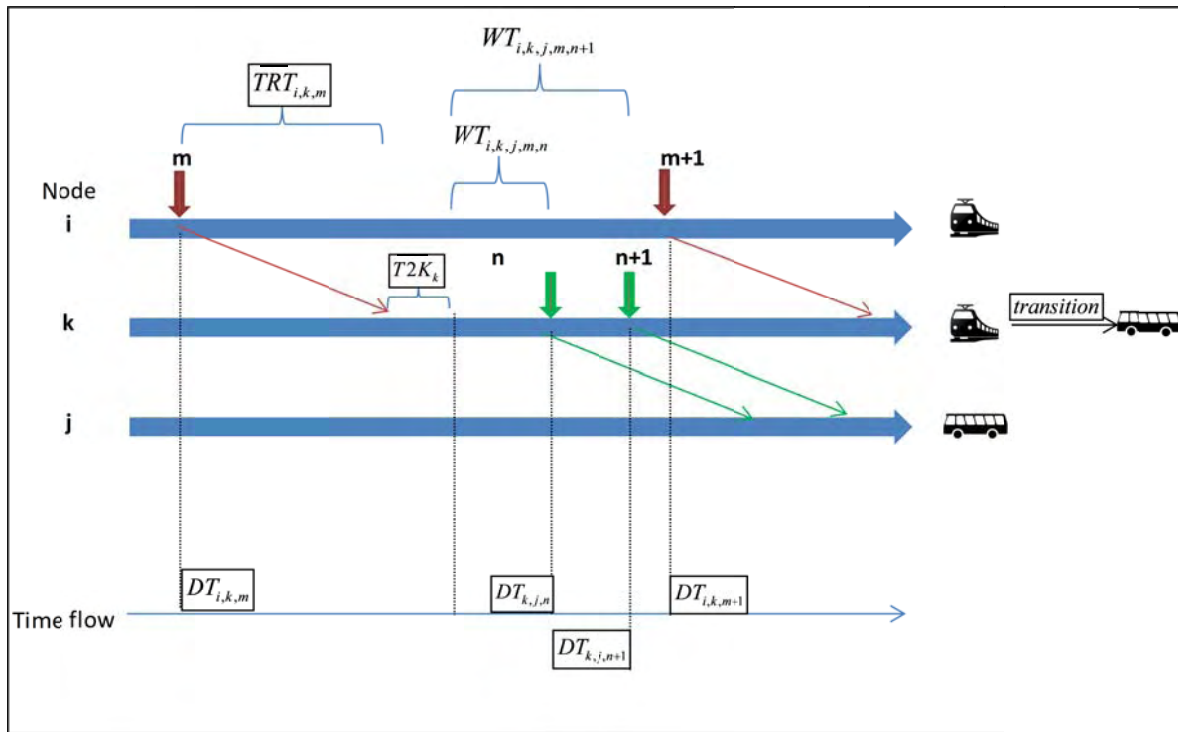


Figure 6: Visual representation of the transition process when the trip starts by train

The figure 6 above shows the transition process in case the trip started by train. Train route m , starts from node i at $DT_{i,k,m}$ (time in minutes) and arrives at node k in $\overline{TRT}_{i,k,m}$ minutes. $\overline{T2K}_k$ represents the time needed to cover the distance between the railway station and the intercity bus station at node k . Then, the trip continues by bus on route n or $n+1$. It is obvious that while the transition from route m to route $n+1$ is possible, it produces a higher waiting time ($WT_{i,k,j,m,n} < WT_{i,k,j,m,n+1}$).

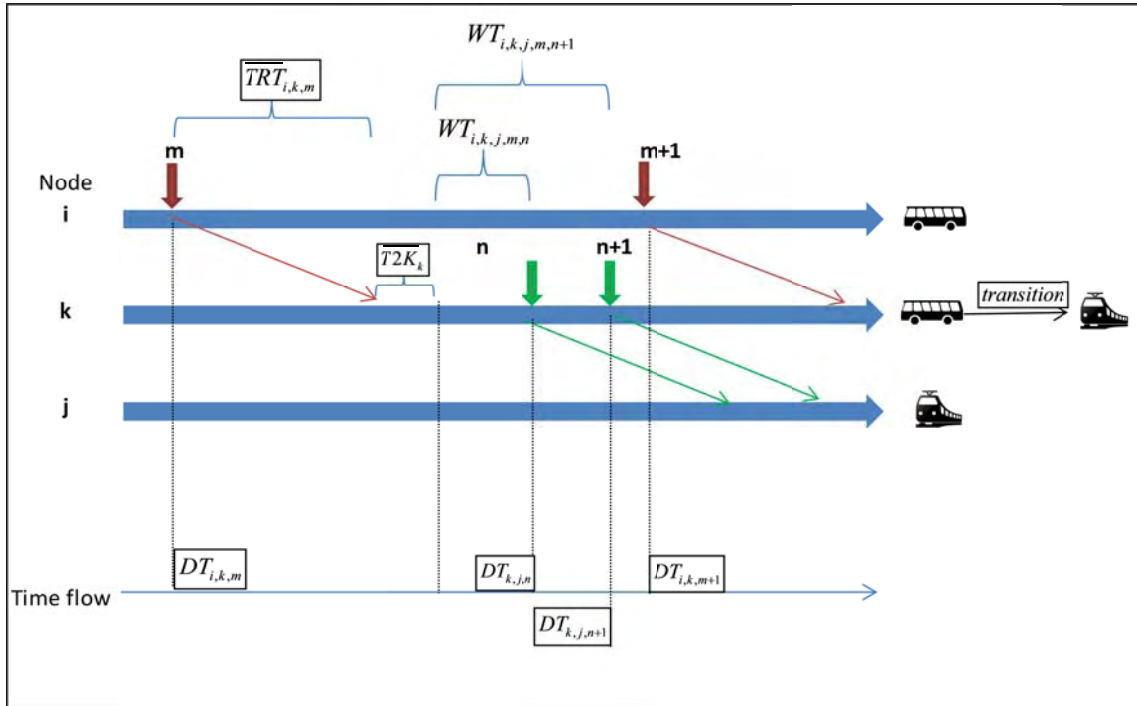


Figure 7: Visual representation of the transition process when the trip starts by bus

The figure 7 above shows the transition process in case the trip started by bus. Bus route m , starts from node i at $DT_{i,k,m}$ (time in minutes) and arrives at node k in $\overline{TRT}_{i,k,m}$ minutes. $\overline{T2K}_k$ represents the time needed to cover the distance between the intercity bus station and the railway station at node k . Then, the trip continues by train on route n or $n+1$. It is obvious that while the transition from route m to route $n+1$ is possible, it produces a higher waiting time ($WT_{i,k,j,m,n} < WT_{i,k,j,m,n+1}$).

4.6 Constraints

There are seven constraints in the mathematical model that ensure consistency remains between the two networks (KTEL and TRAINOSE). In order to understand those constraints, the indices, variables and data used to describe the model, were explained below:

- DT Bounds

Decision variable of departure time from node i to node j with route m or $DT_{i,j,m}$ needs to be restricted between an upper ($\overline{ET}_{i,j,m}$) and a lower bound ($\overline{ST}_{i,j,m}$). The train departure must occur sometime

between these bounds $\overline{ST}_{i,j,m}$ and $\overline{ET}_{i,j,m}$. $DT_{i,j,m}$ represents, apart from train departure, the departure time of intercity buses. However, due to our assumption, the timetables of buses remain invariable. In this case the bounds are made equal to each other and equal to the real bus departure time resulting in binding constraint. Therefore, in case $DT_{i,j,m}$ refers to a bus departure time, it serves as data. Note that in the case of bus synchronization, where railway schedule would be kept unchanged, these bounds could take a different value.

$$\overline{ST}_{i,j,m} \leq DT_{i,j,m} \leq \overline{ET}_{i,j,m} \quad (1)$$

$$\forall i, j \in I \text{ and } \forall m \in \overline{Route}_{i,j}$$

- Binary Y

Binary Y, gets its value from constraints (2) and (3) in the following way:

- it is made equal to 1 when there is a connection between i-k and k-j ($\overline{X}_{i,k}=\overline{X}_{k,j}=1$) and the transition from i to j directly is impossible ($\overline{X}_{i,j}=0$) and the departure time from k to j on route n ($DT_{k,j,n}$) is later than the arrival time from i to k on route m ($DT_{i,k,m}+\overline{TRT}_{i,j,m}+\overline{T2K}_k$), i.e $DT_{k,j,n} \geq DT_{i,k,m}+\overline{TRT}_{i,j,m}+\overline{T2K}_k$ (see constraint 2),
- binary variable Y is equal to 0 when there is a connection between i-k and k-j ($\overline{X}_{i,k}=\overline{X}_{k,j}=1$), but not a direct connection between i and j ($\overline{X}_{i,j}=0$), and the departure time from k to j on route n ($DT_{k,j,n}$) is earlier than the arrival time from i to k on route m ($DT_{i,k,m}+\overline{TRT}_{i,k,m}+\overline{T2K}_k$), i.e. $DT_{k,j,n} \leq DT_{i,k,m}+\overline{TRT}_{i,k,m}+\overline{T2K}_k$ (see constraint 3).

$$\begin{aligned} \bar{m} \cdot (DT_{k,j,n} - DT_{i,k,m} - \overline{TRT}_{i,k,m} - \overline{T2K}_k) - \overline{BigM} \cdot (2 - \overline{X}_{i,k} - \overline{X}_{k,j} - \overline{X}_{i,j}) \\ \leq Y_{i,k,j,m,n} \end{aligned} \quad (2)$$

$$\forall i, k, j \in I, \forall m \in \overline{Route}_{i,k} \text{ and } \forall n \in \overline{Route}_{k,j}$$

$$\begin{aligned} Y_{i,k,j,m,n} \leq 1 + \bar{m} \cdot (DT_{k,j,n} - DT_{i,k,m} - \overline{TRT}_{i,k,m} - \overline{T2K}_k) + \overline{BigM} \cdot (2 - \overline{X}_{i,k} - \overline{X}_{k,j} \\ + \overline{X}_{i,j}) \end{aligned} \quad (3)$$

$$\forall i, k, j \in I, \forall m \in \overline{Route}_{i,k} \text{ and } \forall n \in \overline{Route}_{k,j}$$

- Waiting Time 1

Waiting time is calculated when there is a feasible interchange in node k ($\overline{X}_{i,k}=\overline{X}_{k,j}=1$) and the transition from i to j directly is impossible ($\overline{X}_{i,j}=0$). In addition, it must be examined carefully

whether the transition from i to j makes sense, meaning i or j is part of the synchronizing network ($\bar{L}_{i,j}=0$). Constraint “WAITING TIME 1” only refers to the waiting time of passengers that travel on the first route of n , thus $n=0$ as shown below. It is equal to the departure time from k to j on the first route of n ($n=0$) minus the arrival time on node k . Let here define clearly that arrival time equals to departure time from i to k plus travel time from i to k plus travel time between bus and train station, as shown in constraint (4) below.

$$DT_{k,j,0} - DT_{i,k,m} - \overline{TRT}_{i,k,m} - \overline{T2K}_k - WT_{i,k,j,m,0} - \overline{BtgM} \cdot (2 - \bar{X}_{i,k} - \bar{X}_{k,j} + \bar{X}_{i,j}) \leq 0 \quad (4)$$

$$\forall i, k, j \in I \text{ and } \forall m \in \overline{Route}_{i,k}$$

- Waiting Time 2

Constraint “WAITING TIME 2” has the same role as “WAITING TIME 1” for all the routes, except for the first one. WAITING TIME 1 and WAITING TIME 2 together assure that cases that passengers arrive from node i to k and wait much more time than the earliest existing route from k to i (considered as unnecessary waiting time) will not be calculated. If the transition from m to $n-1$ is feasible, then the waiting time from m to n will be ignored. The constraint (5) below describes the aforementioned situation.

$$DT_{k,j,n} - DT_{i,k,m} - \overline{TRT}_{i,k,m} - \overline{T2K}_k - WT_{i,k,j,m,n} - \overline{BtgM} \cdot Y_{i,k,j,m,n-1} - \overline{BtgM} \cdot (2 - \bar{X}_{i,k} - \bar{X}_{k,j} + \bar{X}_{i,j}) \leq 0 \quad (5)$$

$$\forall i, k, j \in I \text{ and } \forall m \in \overline{Route}_{i,k}, n > 0 \text{ and } n \in \overline{Route}_{k,j}$$

Note that in the aforementioned cases, the value $(2 - \bar{X}_{i,k} - \bar{X}_{k,j} + \bar{X}_{i,j})$ is not really included in the constraint but it is inserted as “if” conditions just before the constraint. What is more, in any other combination of $\bar{X}_{i,k}, \bar{X}_{k,j}, \bar{X}_{i,j}$ except for the aforementioned ones we are not concerned about waiting time and optimization in general, and this is why they are not mentioned.

- Train Continuity

If nodes i,k with connection indicator $t-1$ are sequential (i.e. $\bar{O}_{i,k,t-1} = 1$) and nodes k,j with connection indicator t are sequential (i.e. $\bar{O}_{i,k,t} = 1$), then the departure time from k to j on route n ($DT_{k,j,n}$) equals to the arrival time from i to k on route m ($DT_{i,k,m} + \overline{TRT}_{i,j,m}$). Therefore, this constraint assures that for sequential connections route n from node k to j can be interchanged with route m from node i to k to as they will exist in the same station and at the same time. This

constraint is used only in train optimization as buses do not have three-node approach to describe a route but a two-node one.

$$(DT_{k,j,m} - DT_{i,k,m} - \overline{TRT}_{i,k,m}) \cdot \overline{O}_{i,k,t-1} \cdot \overline{O}_{k,j,t} = 0 \quad (6)$$

$$\forall i, k, j \in I \text{ and } \forall m \in \overline{Route}_{i,k}, t > 0, t \in C$$

- Train/bus route gap

If $\overline{G}_{i,j}$ equals to 1, that means i and j are sequential nodes of a specific TRAINOSE line respectively, the time difference between sequential departures of the same node and line is equal to \overline{GAP} . Using this parameter we avoid that two trains depart from the same node i travelling to the same node j , at exactly the same time. The same situation is avoided with this parameter in KTEL synchronization too.

$$\overline{GAP} \leq (DT_{i,j,m} - DT_{i,j,m-1}) \cdot \overline{G}_{i,j} \quad (7)$$

$$\forall i, k, j \in I, m > 0, m \in \overline{Route}_{i,j}$$

After all the constraints were stated and explained, the objective function of the mathematical model is stated:

$$\min \sum_{i=0}^I \sum_{k=0}^K \sum_{j=0}^J \sum_{m=0}^{\overline{Route}_{i,k}} \sum_{n=0}^{\overline{Route}_{k,j}} WT_{i,k,j,m,n}$$

$$\forall i \neq k, k \neq j, i \neq j$$

The objective function above minimizes the waiting time, as it was defined by the decision variables, under the conditions that ensure the feasibility of each transition ($\overline{X}_{i,k} = \overline{X}_{k,j} = 1$, $\overline{X}_{i,j} = 0$ and $\overline{L}_{i,j} = 0$). These conditions do not exist in the objective, but they are used as constraints before of it in order to exclude minimization of infeasible transitions (if conditions).

4.7 Conclusion

In the aforementioned paragraphs, a completely description of the model used in both networks' optimization was developed. First, they were separately described to understand the differences in setting the data used. Then the model was analyzed in a common sector as it is the same except for a change in continuity constraint. The contents of the model were fully explained and the objective function was clearly stated. Having analyzed the model, we are about to present the results of this procedure in the following chapter.

5. DEPARTURE AND WAITING TIME RESULTS

5.1 Introduction

As we previously stated, when a trip can be occurred using only the train, it is assumed that it will be executed with the exclusive utilization of railway network. Therefore, routes from a node belonging to the TRAINOSE and the KTEL network to another such node are ignored and thus not synchronized. That is the reason why some KTEL data are not included in our synchronization model. To be more specific, as resulted from the existing KTEL timetable, there is bus route from Katerini to Thessaloniki. However, since there is also a train line for this connection, the bus connection is neglected.

The results from the two different cases (TRAINOSE and KTEL) of synchronization are separately presented below. For every region that was synchronized there are three tables; one for the departure times, one for the waiting times and one for the percentage difference of waiting times between the code versions. In the case of intercity bus network, there is one additional table below the synchronized departure timetables that includes the departure time of the current schedule.

Finally, for reader's convenience, the bus departure data for each node are cited in the appendix A. The number of the tables that include data for every node is mentioned in the parenthesis next to the node's name.

5.2 Train Network Results

5.2.1 Athens – Thessaloniki Line

Athens – Thessaloniki Data

As said above, each line functions as a 3 node network. In this line the nodes are:

- 0 Athens (see table 219 in Appendix for KTEL current timetable),
- 1 Larissa (see table 220 in Appendix for KTEL current timetable),

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- 2 Thessaloniki (see table 221 in Appendix for KTEL current timetable).

Athens – Thessaloniki, Results

	From Athens To Thessaloniki			
	Current	10 min	30 min	90 min
Monday	7:18	7:20	7:33	8:03
	10:18	10:19	10:33	10:41
	14:18	14:19	14:24	13:33
	16:16	16:20	16:24	15:33
	18:18	18:22	18:32	19:03
	Current	10 min	30 min	90 min
Tuesday	7:18	7:13	7:03	6:33
	10:18	10:19	10:33	10:40
	14:18	14:20	14:25	13:33
	16:16	16:20	16:24	15:34
	18:18	18:22	18:33	19:00
	Current	10 min	30 min	90 min
Wednesday	7:19	7:14	7:04	6:34
	10:18	10:23	10:33	10:40
	14:18	14:19	14:24	13:33
	16:16	16:21	16:24	15:34
	18:18	18:23	18:32	19:00
	Current	10 min	30 min	90 min
Thursday	7:18	7:13	7:03	6:33
	10:18	10:23	10:33	10:40
	14:18	14:19	14:24	13:33
	16:16	16:21	16:23	15:34
	18:18	18:23	18:32	18:59
	Current	10 min	30 min	90 min
Friday	7:18	7:13	7:03	6:33
	10:18	10:23	10:30	10:50
	14:18	14:20	14:25	13:33
	16:16	16:19	16:19	15:33
	18:18	18:23	18:32	18:59
	Current	10 min	30 min	90 min
Saturday	7:18	7:13	7:03	6:33

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	10:18	10:23	10:33	10:41
	14:18	14:19	14:24	13:33
	16:16	16:21	16:23	16:19
	18:18	18:23	18:33	19:00
	Current	10 min	30 min	90 min
Sunday	7:18	7:13	7:03	6:33
	10:18	10:23	10:33	10:40
	14:18	14:19	14:19	13:33
	16:16	16:19	16:30	15:49
	18:18	18:13	18:03	17:33
	From Thessaloniki To Athens			
	Current	10 min	30 min	90 min
Monday	5:13	5:14	5:05	5:05
	7:04	7:09	7:19	7:39
	10:04	10:08	9:54	9:54
	15:04	15:09	15:19	15:48
	18:04	18:09	18:19	18:49
	Current	10 min	30 min	90 min
Tuesday	5:13	5:10	5:00	5:05
	7:04	7:08	7:19	7:39
	10:04	10:09	10:19	10:48
	15:04	15:09	15:19	15:47
	18:04	18:09	17:52	18:48
	Current	10 min	30 min	90 min
Wednesday	5:13	5:08	4:58	4:28
	7:04	7:09	7:19	7:49
	10:04	10:09	10:19	10:49
	15:04	15:04	15:14	15:44
	18:04	18:09	17:53	18:48
	Current	10 min	30 min	90 min
Thursday	5:13	5:08	4:58	4:28
	7:04	7:09	7:19	7:49
	10:04	10:09	10:19	10:49
	15:04	15:05	15:15	15:45
	18:04	18:09	18:19	18:49

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	Current	10 min	30 min	90 min
Friday	5:13	5:08	4:58	4:28
	7:04	7:09	7:19	7:49
	10:04	10:09	10:19	10:49
	15:04	15:04	15:14	14:23
	18:04	18:09	17:53	18:44
	Current	10 min	30 min	90 min
Saturday	5:13	5:08	4:58	4:28
	7:04	7:07	7:07	7:37
	10:04	10:09	10:19	10:48
	15:04	15:04	15:14	14:22
	18:04	18:09	17:53	17:44
	Current	10 min	30 min	90 min
Sunday	5:13	5:08	4:58	4:27
	7:04	7:09	7:19	7:48
	10:04	10:08	10:19	10:22
	15:04	15:05	15:05	14:19
	18:04	17:59	17:49	17:23

Table 11: Optimized TRAINOSE schedule for Athens - Thessaloniki line

	Current	± 5min	± 15min	± 45min
Total waiting time	691,791	681,208	656,860	602,682
Av. Waiting time	275	271	261	240
Feasible transitions	23,768	23,743	23,732	23,469

Table 12: Results table Athens-Thessaloniki

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.015	0		
± 15min	0.050	0.036	0	
± 45min	0.13	0.115	0.08	0

Table 13: Percentage difference of total waiting time between code cases for Athens-Thessaloniki

The resulting tables above show that more relaxation leads to significantly minimized waiting times. Specifically the 90 minute window, or ±45min case, produces a better solution than the 10 minute window, or ±5min case, by reducing the total waiting time 11.5%,

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which means 78,526 minutes less waiting time. Moreover, the 10 minute window, or ± 5 min case, calculates a total waiting time 1.5% lower than the current.

The average waiting time occurs by dividing the total waiting time with the total number of first feasible transition. The first feasible transition is the first transition that can be occurred, depending on practical time limitations (departure of the second vehicle cannot happen before the arrival of the first one). All next transitions are also feasible. However, as previously stated, there is no need in taking them into consideration, since they do not compose the optimal solution, but only a possible one instead.

5.2.2 Athens – Alexandroupoli

Athens – Alexandroupoli Data

Nodes of Athens – Alexandroupoli line

- 0 Athens (see table 219 in Appendix for KTEL current timetable),
- 1 Thessaloniki (see table 221 in Appendix for KTEL current timetable),
- 2 Alexandroupoli (see table 222 in Appendix for KTEL current timetable).

Athens – Alexandroupoli Results

	From Athens To Alexandroupoli			
	Current	10 min	30 min	90 min
Monday	23:55	23:59	23:59	23:59
Tuesday	23:55	23:59	23:59	23:59
Wednesday	23:55	0:00	0:00	0:00
Thursday	23:55	23:59	23:59	23:59
Friday	23:55	23:59	23:59	23:59
Saturday	23:55	0:00	0:00	0:00
Sunday	23:55	23:50	23:40	23:10
	From Alexandroupoli To Athens			
	Current	10 min	30 min	90 min
Monday	15:19	15:22	15:26	15:26
Tuesday	15:19	15:22	15:34	16:04
Wednesday	15:19	15:16	15:25	15:25

Thursday	15:19	15:16	15:24	15:24
Friday	15:19	15:17	15:24	15:24
Saturday	15:19	15:22	15:06	14:37
Sunday	15:19	15:24	15:07	14:36

Table 14: Optimized TRAINOSE schedule for Athens – Alexandroupoli line

	Current	± 5min	± 15min	± 45min
Total waiting time	546,430	531,785	524,149	520,502
Av. Waiting time	428	417	412	411
Feasible transitions	3,806	3,807	3,802	3,776

Table 15: Results table Athens-Alexandroupoli

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.0268	0		
± 15min	0.04	0.0144	0	
± 45min	0.0475	0.021	0.007	0

Table 16: Percentage difference of total waiting time between code cases for Athens-Alexandroupoli

Table 16 above shows that the percentage difference of the 90 and 30 minute windows, or ±45min case and ±15min case respectively, is not significant (0,7%). However, the 30 minute window is preferred to a further relaxation, especially since great changes on the railway schedule are neither effortless nor desired.

5.2.3 Athens – Chalkida Line

Athens – Chalkida Data

Nodes of Athens – Chalkida line

- 0 Athens (see table 219 in Appendix for KTEL current timetable),
- 1 Inoi,
- 2 Chalkida (see table 223 in Appendix for KTEL current timetable).

Athens – Chalkida Results

	From Athens To Chalkida			
	Current	10 min	30 min	90 min

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Monday	5:44	5:38	5:29	4:59
	6:44	6:49	6:59	7:29
	8:44	8:39	8:34	9:15
	10:44	10:45	10:44	10:59
	12:44	12:39	12:29	12:29
	14:44	14:45	14:45	14:19
	15:44	15:39	15:49	16:20
	16:44	16:39	16:34	17:19
	18:44	18:45	18:49	18:59
	20:44	20:44	20:44	21:00
	22:44	22:39	22:30	21:58
	Current	10 min	30 min	90 min
Tuesday	5:44	5:38	5:29	4:59
	6:44	6:49	6:59	6:14
	8:44	8:38	8:59	9:15
	10:44	10:45	10:45	10:45
	12:44	12:39	12:29	12:14
	14:44	14:45	14:44	14:20
	15:44	15:39	15:50	15:50
	16:44	16:38	16:35	17:19
	18:44	18:45	18:49	18:59
	20:44	20:45	20:45	21:00
	22:44	22:39	22:30	23:19
	Current	10 min	30 min	90 min
Wednesday	5:44	5:39	5:29	4:58
	6:44	6:38	6:59	6:13
	8:44	8:39	8:35	9:14
	10:44	10:45	10:45	10:45
	12:44	12:39	12:29	12:15
	14:44	14:45	14:28	14:14
	15:44	15:39	15:28	14:59
	16:44	16:39	16:30	17:00
	18:44	18:45	18:45	19:00
	20:44	20:45	20:45	20:59
	22:44	22:39	22:30	22:30

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	Current	10 min	30 min	90 min
Thursday	5:44	5:39	5:29	4:58
	6:44	6:38	6:59	6:13
	8:44	8:39	8:29	8:15
	10:44	10:44	10:50	10:49
	12:44	12:44	12:44	12:44
	14:44	14:44	14:28	13:59
	15:44	15:44	15:44	15:00
	16:44	16:39	16:30	16:59
	18:44	18:45	18:45	18:59
	20:44	20:44	20:44	20:59
	22:44	22:39	22:30	22:29
	Current	10 min	30 min	90 min
Friday	5:44	5:39	5:29	4:59
	6:44	6:38	6:59	5:59
	8:44	8:39	8:29	8:14
	10:44	10:45	10:50	11:00
	12:44	12:45	12:45	12:00
	14:44	14:45	14:45	13:59
	15:44	15:44	15:45	14:59
	16:44	16:39	16:30	16:29
	18:44	18:45	18:44	18:59
	20:44	20:39	20:29	20:29
	22:44	22:39	22:30	22:29
	Current	10 min	30 min	90 min
Saturday	6:44	6:39	6:29	5:59
	8:44	8:39	8:29	9:15
	10:44	10:45	10:50	10:59
	12:44	12:44	12:44	12:00
	14:44	14:44	14:44	13:59
	16:44	16:39	16:29	16:29
	18:44	18:45	18:45	19:00
	20:44	20:39	20:30	20:30
	22:44	22:39	22:29	23:19
	Current	10 min	30 min	90 min

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Sunday	6:44	6:39	6:29	5:59
	8:44	8:38	8:28	9:14
	10:44	10:45	10:45	10:59
	12:44	12:44	12:44	12:00
	14:44	14:44	14:44	14:19
	16:44	16:39	16:29	16:19
	18:44	18:45	18:45	18:59
	20:44	20:39	20:30	20:30
	22:44	22:39	22:29	21:59
	From Chalkida To Athens			
	Current	10 min	30 min	90 min
Monday	5:27	5:21	5:12	4:42
	6:27	6:32	6:17	6:46
	7:27	7:32	7:42	7:46
	8:27	8:32	8:42	8:47
	10:27	10:32	10:42	10:46
	12:27	12:32	12:17	12:17
	14:27	14:32	14:31	14:31
	16:27	16:32	16:31	16:31
	17:27	17:32	17:42	17:46
	18:27	18:32	18:31	18:31
	20:27	20:32	20:42	19:47
	22:27	22:32	22:42	23:12
	Current	10 min	30 min	90 min
Tuesday	5:27	5:32	5:42	6:01
	6:27	6:32	6:42	6:46
	7:27	7:32	7:42	7:46
	8:27	8:32	8:42	8:47
	10:27	10:32	10:42	11:12
	12:27	12:32	12:16	12:16
	14:27	14:32	14:31	14:31
	16:27	16:32	16:17	16:16
	17:27	17:32	17:42	17:46
	18:27	18:32	18:42	19:12
	20:27	20:22	20:12	19:57

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	22:27	22:21	22:11	22:45
	Current	10 min	30 min	90 min
Wednesday	5:27	5:22	5:12	4:42
	6:27	6:21	6:42	5:47
	7:27	7:21	7:42	6:47
	8:27	8:21	8:42	7:47
	10:27	10:21	10:11	10:47
	12:27	12:22	12:15	12:15
	14:27	14:21	14:11	13:42
	16:27	16:22	16:11	15:42
	17:27	17:21	17:12	16:47
	18:27	18:21	18:17	19:00
	20:27	20:22	20:12	19:44
	22:27	22:21	22:11	22:45
	Current	10 min	30 min	90 min
Thursday	5:27	5:22	5:12	4:42
	6:27	6:21	6:42	6:47
	7:27	7:21	7:42	7:32
	8:27	8:21	8:42	8:17
	10:27	10:21	10:11	10:47
	12:27	12:22	12:15	12:15
	14:27	14:21	14:11	13:42
	16:27	16:21	16:11	16:32
	17:27	17:21	17:12	17:17
	18:27	18:21	18:17	18:57
	20:27	20:21	20:11	21:12
	22:27	22:21	22:11	23:12
	Current	10 min	30 min	90 min
Friday	5:27	5:21	5:12	4:47
	6:27	6:21	6:42	6:17
	7:27	7:21	7:42	7:02
	8:27	8:21	8:42	7:47
	10:27	10:21	10:11	9:47
	12:27	12:21	12:42	12:47
	14:27	14:21	14:42	14:47

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	16:27	16:21	16:42	16:17
	17:27	17:21	17:42	17:17
	18:27	18:21	18:42	18:32
	20:27	20:21	20:42	19:47
	22:27	22:21	22:11	23:12
	Current	10 min	30 min	90 min
Saturday	6:27	6:21	6:11	5:47
	8:27	8:21	8:11	7:47
	10:27	10:21	10:11	9:47
	12:27	12:21	12:17	12:17
	14:27	14:21	14:42	13:47
	16:27	16:21	16:11	16:47
	18:27	18:21	18:17	18:17
	20:27	20:21	20:42	19:47
	22:27	22:21	22:11	23:12
	Current	10 min	30 min	90 min
Sunday	6:27	6:21	6:11	5:47
	8:27	8:21	8:11	7:47
	10:27	10:21	10:11	10:02
	12:27	12:21	12:17	12:47
	14:27	14:21	14:42	14:17
	16:27	16:21	16:42	16:17
	18:27	18:21	18:32	18:32
	20:27	20:21	20:17	20:17
	22:27	22:21	22:11	23:12

Table 17: Optimized TRAINOSE schedule for Athens – Chalkida line

	Current	± 5min	± 15min	± 45min
Total waiting time	365,104	355,500	343,433	307,456
Av. Waiting time	221	215	208	187
Feasible transitions	28,067	28,078	28,086	28,065

Table 18: Results table Athens-Chalkida

	Current	± 5min	± 15min	± 45min
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Current	0			
± 5min	0.026	0		
± 15min	0.059	0.034	0	
± 45min	0.158	0.135	0.105	0

Table 19: Percentage difference of total waiting time between code cases for Athens-Chalkida

As it is shown from the resulting tables the percentage minimization in total waiting time is from 2.6% between current and 10 minute window case and can reach up to 15.8% between current and 90 minute window case. This means a reduction from almost 10,000 to 60,000 minutes in total waiting as shown in the results table.

5.2.4 Athens – Kalampaka Line

Athens – Kalampaka Data

Nodes of Athens – Kalampaka line:

- 0 Athens (see table 219 in Appendix for KTEL current timetable),
- 1 Karditsa (see table 224 in Appendix for KTEL current timetable),
- 2 Trikala (see table 225 in Appendix for KTEL current timetable).

Athens – Kalampaka Results

	From Athens To Kalampaka			
	Current	10 min	30 min	90 min
Monday	8:27	8:30	8:39	8:59
Tuesday	8:27	8:22	8:12	7:42
Wednesday	8:27	8:22	8:12	7:42
Thursday	8:27	8:22	8:12	7:41
Friday	8:27	8:22	8:14	7:41
Saturday	8:27	8:22	8:14	7:41
Sunday	8:27	8:22	8:12	7:42
	From Kalampaka To Athens			
	Current	10 min	30 min	90 min
Monday	17:38	17:33	17:24	18:20
Tuesday	17:38	17:33	17:25	18:19
Wednesday	17:38	17:33	17:25	18:19
Thursday	17:38	17:33	17:24	18:20
Friday	17:38	17:33	17:24	18:19

Saturday	17:38	17:33	17:25	18:03
Sunday	17:38	17:33	17:23	16:53

Table 20: Optimized TRAINOSE schedule for Athens – Kalampaka line

	Current	± 5min	± 15min	± 45min
Total waiting time	1,331,631	1,322,335	1,312,051	1,279,963
Av. Waiting time	690	685	680	665
Feasible transitions	5,363	5,370	5,356	5,287

Table 21: Results table Athens-Kalampaka

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.007	0		
± 15min	0.015	0.008	0	
± 45min	0.039	0.032	0.024	0

Table 22: Percentage difference of total waiting time between code cases for Athens-Kalampaka

In Athens-Kalampaka occasion above, the resulting reduction is not significant. It varies from 0.7% up to 3.9% between 90 minute window and current case, which is little percentage difference. However this 3.9% equals to almost 50,000 minutes reduction in total waiting time and about 25 minutes less in average for every occurred transition.

5.2.5 Kalampaka – Paleofarsalos Line

Kalampaka – Paleofarsalos Data

Nodes of line Kalampaka – Paleofarsalos

- 0 Kalampaka,
- 1 Trikala (see table 225 in Appendix for KTEL current timetable),
- 2 Karditsa (see table 224 in Appendix for KTEL current timetable).

Kalampaka – Paleofarsalos Results

	From Kalampaka To Paleofarsalos			
	Current	10 min	30 min	90 min
Monday	5:42	5:47	5:57	6:00

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	19:30	19:35	19:40	19:40
Tuesday	5:42	5:40	5:39	5:19
	19:30	19:35	19:45	20:10
Wednesday	5:42	5:40	5:35	6:15
	19:30	19:24	19:40	20:10
Thursday	5:42	5:40	5:35	6:15
	19:30	19:24	19:40	20:10
Friday	5:42	5:40	5:35	6:15
	19:30	19:24	19:40	20:10
Saturday	5:42	5:36	5:54	5:55
	19:30	19:24	19:40	19:10
Sunday	5:42	5:36	5:26	5:10
	19:30	19:24	19:40	19:10
From Paleofarsalo To Kalampaka				
	Current	10 min	30 min	90 min
Monday	7:18	7:20	7:19	8:00
	20:49	20:44	20:34	20:04
Tuesday	2:18	2:13	2:03	1:33
	20:49	20:44	20:34	20:04
Wednesday	2:18	2:13	2:03	1:33
	20:49	20:44	20:34	20:04
Thursday	2:18	2:13	2:03	1:33
	20:49	20:44	20:34	20:04
Friday	2:18	2:13	2:03	1:33
	20:49	20:44	20:34	20:04
Saturday	2:18	2:13	2:03	1:33
	20:49	20:44	20:34	20:24

Sunday	2:18	2:13	2:03	1:33
	20:49	20:44	20:34	20:04

Table 23: Optimized TRAINOSE schedule for Kalampaka – Paleofarsalos line

	Current	± 5min	± 15min	± 45min
Total waiting time	1489,49	145,650	142,515	134,743
Av. Waiting time	174	170	166	158
Feasible transitions	1,274	1,278	1,276	1,270

Table 24: Results table Kalampaka-Paleofarsalos

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.022	0		
± 15min	0.043	0.0215	0	
± 45min	0.095	0.075	0.055	0

Table 25: Percentage difference of total waiting time between code cases for Kalampaka-Paleofarsalos

In the above occasion, a reduction from 2.2% between current and 10 minute window up to 9.5% between current and 90 minute window is observed. This is not a significant reduction as percentage, but taking into consideration the total waiting time, it is a reduction of almost 14,000 minutes. What is more, the average waiting time is reduced up to 16 minutes between current and 90 minute window case.

5.2.6 Thessaloniki – Larissa Line

Thessaloniki – Larissa Data

Nodes of Thessaloniki – Larissa Line:

- 0 Thessaloniki (see table 221 in Appendix for KTEL current timetable),
- 1 Katerini (see table 226 in Appendix for KTEL current timetable),
- 2 Larissa (see table 220 in Appendix for KTEL current timetable).

Thessaloniki - Larissa Results

From Thessaloniki To Larissa				
	Current	10 min	30 min	90 min

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Monday	5:37	5:42	5:30	5:14
	6:40	6:35	6:30	6:30
	8:00	8:05	8:15	8:45
	12:58	13:00	12:44	12:15
	14:25	14:30	14:15	14:45
	17:14	17:15	17:15	17:45
	18:37	18:42	18:45	19:00
	21:47	21:45	22:00	22:29
	Current	10 min	30 min	90 min
Tuesday	5:37	5:42	5:44	5:14
	6:40	6:35	6:30	6:29
	8:00	8:05	8:15	8:45
	12:58	12:59	12:45	12:14
	14:25	14:30	14:15	14:15
	17:14	17:09	16:59	16:44
	18:37	18:42	18:45	19:00
	21:47	21:45	21:59	22:29
	Current	10 min	30 min	90 min
Wednesday	5:37	5:32	5:22	4:52
	6:40	6:35	6:30	6:29
	8:00	7:55	8:14	8:44
	12:58	12:59	12:44	12:15
	14:25	14:29	14:10	15:04
	17:14	17:09	16:59	16:55
	18:37	18:32	18:45	19:00
	21:47	21:45	22:00	22:29
	Current	10 min	30 min	90 min
Thursday	5:37	5:32	5:22	4:52
	6:40	6:35	6:30	6:29
	8:00	7:55	8:15	8:45
	12:58	12:59	12:44	12:14
	14:25	14:29	14:10	15:04
	17:14	17:09	16:59	16:55
	18:37	18:32	18:45	18:59
	21:47	21:45	22:00	22:29

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	Current	10 min	30 min	90 min
Friday	5:37	5:32	5:22	4:52
	6:40	6:34	6:30	6:30
	8:00	7:55	8:15	8:45
	12:58	13:00	12:45	12:14
	14:25	14:30	14:10	15:04
	17:14	17:09	16:59	16:54
	18:37	18:32	18:45	18:59
	21:47	21:45	22:00	22:29
	Current	10 min	30 min	90 min
Saturday	5:37	5:32	5:22	4:51
	6:40	6:34	6:30	6:30
	8:00	8:05	8:15	8:30
	12:58	12:59	12:44	12:15
	14:25	14:29	14:10	15:04
	17:14	17:09	16:59	16:54
	18:37	18:32	18:45	19:00
	21:47	21:45	22:00	22:30
	Current	10 min	30 min	90 min
Sunday	5:37	5:32	5:22	4:52
	6:40	6:45	6:55	7:25
	8:00	8:05	8:15	8:45
	12:58	12:59	12:45	12:14
	14:25	14:29	14:10	15:05
	17:14	17:09	16:58	16:55
	18:37	18:32	18:45	18:59
	21:47	21:42	21:32	21:02
From Larissa To Thessaloniki				
	Current	10 min	30 min	90 min
Monday	6:00	6:05	6:15	6:30
	7:23	7:28	7:37	7:45
	8:30	8:35	8:44	9:15
	10:43	10:38	10:50	11:15
	14:50	14:45	14:45	14:44
	16:45	16:45	16:45	17:15

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	19:00	19:05	19:15	19:14
	21:09	21:14	21:15	21:15
	Current	10 min	30 min	90 min
Tuesday	6:00	6:00	5:44	5:15
	7:23	7:28	7:37	7:45
	8:30	8:35	8:45	9:15
	10:43	10:38	10:50	11:14
	14:50	14:45	14:45	14:44
	16:45	16:44	16:45	17:14
	19:00	18:55	19:15	19:20
	21:09	21:10	21:10	21:44
	Current	10 min	30 min	90 min
Wednesday	6:00	5:55	5:45	5:15
	7:23	7:25	7:34	7:44
	8:30	8:35	8:45	9:14
	10:43	10:38	10:50	11:15
	14:50	14:45	14:44	14:44
	16:45	16:45	16:44	16:44
	19:00	18:55	18:45	18:34
	21:09	21:10	21:14	21:44
	Current	10 min	30 min	90 min
Thursday	6:00	5:55	5:45	5:15
	7:23	7:25	7:34	7:45
	8:30	8:35	8:44	9:15
	10:43	10:38	10:49	11:15
	14:50	14:45	14:44	14:44
	16:45	16:45	16:45	17:14
	19:00	18:55	18:45	19:19
	21:09	21:10	21:09	21:45
	Current	10 min	30 min	90 min
Friday	6:00	5:55	5:45	5:15
	7:23	7:24	7:35	7:44
	8:30	8:35	8:44	9:14
	10:43	10:38	10:50	11:14
	14:50	14:45	14:45	14:45

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	16:45	16:44	16:44	16:35
	19:00	18:55	18:45	18:34
	21:09	21:10	21:15	21:44
	Current	10 min	30 min	90 min
Saturday	6:00	5:55	5:45	5:15
	7:23	7:18	7:15	8:04
	8:30	8:30	8:45	9:15
	10:43	10:38	10:34	11:14
	14:50	14:45	14:44	14:15
	16:45	16:40	16:30	16:09
	19:00	18:55	18:44	18:29
	21:09	21:09	21:09	21:45
	Current	10 min	30 min	90 min
Sunday	6:00	5:55	5:45	5:15
	7:23	7:28	7:38	7:45
	8:30	8:30	8:30	9:09
	10:43	10:38	10:54	11:09
	14:50	14:45	14:44	14:44
	16:45	16:50	16:50	17:14
	19:00	18:55	18:45	18:15
	21:09	21:04	20:54	20:24

Table 26: Optimized TRAINOSE schedule for Thessaloniki – Larissa line

	Current	± 5min	± 15min	± 45min
Total waiting time	340,379	323,543	294,989	265,325
Av. Waiting time	162	155	141	127
Feasible transitions	24,001	24,016	24,019	23,931

Table 27: Results table Thessaloniki-Larissa

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.049	0		
± 15min	0.133	0.088	0	
± 45min	0.2205	0.18	0.1	0

Table 28: Percentage difference of total waiting time between code cases for Thessaloniki-Larissa

In this occasion, reduction is significant relatively to the above occasions. There is a 4.9% reduction between current and 10 minute window case, 13.3% between current and 30 minute

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window case and 22% between current and 90 minute window case. That means a reduction to the total waiting time up to almost 75,000 minutes and to average waiting time up to 35 minutes.

5.2.7 Thessaloniki - Kalampaka Line

Thessaloniki – Kalampaka Data

Nodes of Thessaloniki – Kalampaka Line:

- 0 Thessaloniki (see table 221 in Appendix for KTEL current timetable),
- 1 Katerini (see table 226 in Appendix for KTEL current timetable),
- 2 Trikala (see table 225 in Appendix for KTEL current timetable),

Thessaloniki – Kalampaka Results

	From Thessaloniki to Kalampaka			
	Current	10 min	30 min	90 min
Monday	16:17	16:12	16:02	16:54
Tuesday	16:17	16:12	16:02	16:54
Wednesday	16:17	16:12	16:02	16:55
Thursday	16:17	16:12	16:02	16:55
Friday	16:17	16:12	16:02	16:54
Saturday	16:17	16:12	16:02	16:54
Sunday	16:17	16:12	16:02	15:33
	From Kalampaka to Thessaloniki			
	Current	10 min	30 min	90 min
Monday	8:35	8:40	8:49	9:00
Tuesday	8:35	8:34	8:50	9:00
Wednesday	8:35	8:35	8:50	9:00
Thursday	8:35	8:35	8:49	8:59
Friday	8:35	8:34	8:49	8:59
Saturday	8:35	8:30	8:45	8:45
Sunday	8:35	8:30	8:21	7:51

Table 29: Optimized TRAINOSE schedule for Thessaloniki – Kalampaka line

	Current	± 5min	± 15min	± 45min
Total waiting time	648,042	645,027	625,162	600,911

Av. Waiting time	695	691	669	646
Feasible transitions	2,087	2,087	2,072	2,075

Table 30: Results table Thessaloniki-Kalampaka

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.005	0		
± 15min	0.0353	0.0308	0	
± 45min	0.073	0.0684	0.0388	0

Table 31: Percentage difference of total waiting time between code cases for Thessaloniki-Kalampaka

In this occasion, the percentage reduction is 0.5% between current and 10 minute window case, 3.5% between current and 30 minute window case and 7.3% between current and 90 minute window case. This equals to a reduction of almost 48,000 minutes in total waiting time between current and 90 minute window case and almost 40 minutes in average waiting time respectively.

5.2.8 Thessaloniki – Florina Line

Thessaloniki – Florina Data

Nodes of Thessaloniki – Florina line:

- 0 Thessaloniki (see table 221 in Appendix for KTEL current timetable),
- 1 Veria (see table 227 in Appendix for KTEL current timetable),
- 2 Florina (see table 228 in Appendix for KTEL current timetable),

Thessaloniki – Florina Results

	From Thessaloniki to Florina			
	Current	10 min	30 min	90 min
Monday	7:14	7:19	7:28	7:59
	12:23	12:17	12:08	11:54
	19:30	19:30	19:45	20:14
Tuesday	7:14	7:09	7:04	7:54

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	12:23	12:17	12:08	11:54
	19:30	19:30	19:44	19:59
Wednesday	7:14	7:09	7:05	6:28
	12:23	12:18	12:08	11:55
	19:30	19:30	19:44	19:59
Thursday	7:14	7:09	7:04	6:28
	12:23	12:18	12:08	11:55
	19:30	19:30	19:45	20:15
Friday	7:14	7:09	7:04	7:30
	12:23	12:18	12:14	12:59
	19:30	19:30	19:45	20:14
Saturday	7:14	7:09	7:04	6:28
	12:23	12:18	12:15	13:00
	19:30	19:30	19:44	19:59
Sunday	7:14	7:09	7:05	6:28
	12:23	12:18	12:15	12:59
	19:30	19:25	19:14	18:45
	From Florina to Thessaloniki			
	Current	10 min	30 min	90 min
Monday	6:15	6:20	6:30	5:42
	9:59	10:04	10:13	10:42
	16:12	16:11	16:10	16:40
Tuesday	6:15	6:20	6:30	5:42
	9:59	10:04	10:13	10:42
	16:12	16:11	16:10	16:40
Wednesday	6:15	6:20	6:30	5:42
	9:59	9:54	9:44	9:14
	16:12	16:07	15:59	15:59

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Thursday	6:15	6:20	6:30	5:42
	9:59	9:54	9:44	9:14
	16:12	16:07	15:59	15:59
Friday	6:15	6:20	6:30	5:42
	9:59	9:54	9:44	9:14
	16:12	16:07	15:59	16:00
Saturday	6:15	6:10	6:00	5:30
	9:59	10:04	10:14	10:44
	16:12	16:07	16:00	16:57
Sunday	6:15	6:12	6:00	5:30
	9:59	10:04	10:14	10:44
	16:12	16:07	15:57	15:27

Table 32: Optimized TRAINOSE schedule for Thessaloniki – Florina line

	Current	± 5min	± 15min	± 45min
Total waiting time	286,819	284,659	266,915	246,533
Av. Waiting time	287	284	266	248
Feasible transitions	5,081	5,076	5,064	5,070

Table 33: Results table Thessaloniki-Florina

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.0075	0		
± 15min	0.0694	0.0623	0	
± 45min	0.1405	0.134	0.076	0

Table 34: Percentage difference of total waiting time between code cases for Thessaloniki-Florina

In Thessaloniki-Florina occasion above, the percentage reduction is 0.75% between current and 10 minute window case, 7% between current and 30 minute window case and 14% between current and 90 minute window case. Thus, 90 minute window case with relaxation of 45 minutes of current timetable is preferable to 10 minute window case in order to observe a reduction of almost 40,000 minutes in total waiting time and 40 minutes in average waiting time from current timetable. The reduction is only 2,000 minutes in total waiting time and 3 minutes in average waiting time between current and 10 minute window case.

5.2.9 Thessaloniki – Edessa Line

Thessaloniki – Edessa Data

Nodes of Thessaloniki – Edessa line:

- 0 Thessaloniki (see table 221 in Appendix for KTEL current timetable),
- 1 Veria (see table 227 in Appendix for KTEL current timetable),
- 2 Edessa (see table 229 in Appendix for KTEL current timetable).

Thessaloniki – Edessa Results

	From Thessaloniki to Edessa			
	Current	10 min	30 min	90 min
Monday	15:47	15:44	15:44	15:59
	21:32	21:30	21:45	22:14
Tuesday	15:47	15:45	15:45	15:14
	21:32	21:29	21:45	22:14
Wednesday	15:47	15:45	15:45	15:14
	21:32	21:29	21:45	22:15
Thursday	15:47	15:44	15:44	15:15
	21:32	21:30	21:45	22:14
Friday	15:47	15:44	15:44	15:14
	21:32	21:30	21:45	22:14
Saturday	15:47	15:45	15:45	15:14
	21:32	21:29	21:45	21:59
Sunday	15:47	15:45	15:59	15:05
	21:32	21:27	21:16	20:47
	From Edessa to Thessaloniki			
	Current	10 min	30 min	90 min
Monday	4:50	4:55	5:05	5:26

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	20:56	20:50	20:40	20:11
Tuesday	4:50	4:55	5:05	5:26
	20:56	20:51	20:41	20:29
Wednesday	4:50	4:55	5:05	5:35
	20:56	20:51	20:41	20:30
Thursday	4:50	4:55	5:05	5:35
	20:56	20:51	20:41	20:29
Friday	4:50	4:55	5:05	5:35
	20:56	20:51	20:41	20:29
Saturday	4:50	4:55	5:05	5:35
	20:56	20:51	20:41	20:30
Sunday	4:50	4:55	5:05	5:35
	20:56	20:51	20:41	20:11

Table 35: Optimized TRAINOSE schedule for Thessaloniki – Edessa line

	Current	± 5min	± 15min	± 45min
Total waiting time	379,730	377,248	363,302	344,367
Av. Waiting time	358	356	343	326
Feasible transitions	3,977	3,976	3,981	3,946

Table 36: Results table Thessaloniki-Edessa

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.0065	0		
± 15min	0.043	0.037	0	
± 45min	0.093	0.087	0.052	0

Table 37: Percentage difference of total waiting time between code cases for Thessaloniki-Edessa

In the above occasion total waiting time is reduced 0.65% from current to 10 minute window case, 4.3% from current to 30 minute window case and 9.3% from current to 90 minute reduction. Despite the fact that the percentages are not significant, it equals to almost

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2,000, 16,000 and 30,000 minutes reduction in total waiting time between the aforementioned cases respectively.

5.2.10 Thessaloniki – Paleofarsalos Line

Thessaloniki – Paleofarsalos Data

Nodes of Thessaloniki – Paleofarsalos line:

- 0 Thessaloniki (see table 221 in Appendix for KTEL current timetable),
- 1 Katerini (see table 226 in Appendix for KTEL current timetable),
- 2 Larissa (see table 220 in Appendix for KTEL current timetable),

Thessaloniki – Paleofarsalos Results

From Thessaloniki to Paleofarsalos				
	Current	10 min	30 min	90 min
Monday	10:22	10:16	10:07	10:54
Tuesday	10:22	10:16	10:07	10:55
Wednesday	10:22	10:17	10:07	10:54
Thursday	10:22	10:17	10:07	10:54
Friday	10:22	10:17	10:07	10:54
Saturday	10:22	10:17	10:07	10:55
Sunday	10:22	10:17	10:07	9:37
From Paleofarsalo to Thessaloniki				
	Current	10 min	30 min	90 min
Monday	12:52	12:46	13:05	13:05
Tuesday	12:52	12:46	12:37	13:09
Wednesday	12:52	12:47	12:37	13:19
Thursday	12:52	12:47	12:37	13:10
Friday	12:52	12:47	12:37	13:19
Saturday	12:52	12:47	12:37	12:20
Friday	12:52	12:47	12:37	12:07

Table 38: Optimized TRAINOSE schedule for Thessaloniki – Paleofarsalos line

	Current	± 5min	± 15min	± 45min
Total waiting time	1,012,616	1,006,761	992,385	966,114
Av. Waiting time	740	735	725	710

Feasible transitions	2,973	2,968	2,954	2,950
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Table 39: Results table Thessaloniki-Paleofarsalos

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.0058	0		
± 15min	0.02	0.0143	0	
± 45min	0.046	0.04	0.026	0

Table 40: Percentage difference of total waiting time between code cases for Thessaloniki-Paleofarsalos

In the Thessaloniki-Paleofarsalos above, reduction is not significant at all. More precisely, the percentage reduction between current and 10 minute window case as shown is only 0.5%; between current and 30 minute window case is 2% and between current and 90 minute window case is 4.6%. However, the reduction between current and 90 minute window is more than twice the percentage reduction between current and 30 minute window case. This can easily be observed by looking the results table where the total waiting time is reduced up to almost 47,000 minutes between current and 90 minute window case. Moreover, the reduction in total waiting times is only 12,000 minutes between current and 10 minute window case, thus about 4 times less.

5.2.11 Thessaloniki – Dikaia Line

Thessaloniki – Dikaia Data

Nodes of Thessaloniki – Dikaia line:

- 0 Thessaloniki (see table 221 in Appendix for KTEL current timetable),
- 1 Xanthi (see table 230 in Appendix for KTEL current timetable),
- 2 Alexandroupoli (see table 222 in Appendix for KTEL current timetable),

Thessaloniki – Dikaia Results

	From Thessaloniki To Dikaia			
	Current	10 min	30 min	90 min
Monday	16:01	15:59	15:59	16:45
Tuesday	16:01	16:00	16:00	16:44
Wednesday	16:01	16:00	15:59	16:44
Thursday	16:01	15:56	15:54	16:44
Friday	16:01	15:56	15:55	16:44

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Saturday	16:01	15:56	15:55	16:45
Sunday	16:01	15:56	15:46	15:16
From Dikaia to Thessaloniki				
	Current	10 min	30 min	90 min
Monday	6:52	6:55	7:05	7:37
Tuesday	6:52	6:55	7:05	6:16
Wednesday	6:52	6:57	7:05	6:16
Thursday	6:52	6:57	7:06	6:16
Friday	6:52	6:57	7:06	6:16
Saturday	6:52	6:47	6:37	6:07
Sunday	6:52	6:47	6:37	6:07

Table 41: Optimized TRAINOSE schedule for Thessaloniki – Dikaia line

	Current	± 5min	± 15min	± 45min
Total waiting time	627,527	625,614	623,858	611,312
Av. Waiting time	546	545	542	530
Feasible transitions	3,159	3,158	3,137	3,114

Table 42: Results table Thessaloniki-Dikaia

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.003	0		
± 15min	0.006	0.0028	0	
± 45min	0.026	0.023	0.02	0

Table 43: Percentage difference of total waiting time between code cases for Thessaloniki-Dikaia

Thessaloniki-Dikaia is reduced only by 2.6% in the above cases. More precisely, between current and 10minute window case the reduction is equal to only 0.3%, between current and 30 minute window case equals to 0.6% and between current and 90 minute window case 2.6% respectively. That means 2,000 minutes reduction in total waiting time between current and 10 minute window, 4,000 minutes reduction between current and 30 minute window and 16,000 minutes between current and 90 minute window respectively. In spite of the low percentage, the reduction of 16,000 minutes is significant and means a reduction of 16 minutes in average waiting time.

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5.2.12 Larissa – Volos Line

Larissa – Volos Data

Nodes of Larissa- Volos line:

- 0 Larissa (see table 220 in Appendix for KTEL current timetable),
- 1 Velestine,
- 2 Volos (see table 231 in Appendix for KTEL current timetable).

Larissa – Volos Results

		From Larissa to Volos		
	Current	10 min	30 min	90 min
Monday	4:37	4:31	4:22	3:52
	6:37	6:42	6:52	7:22
	8:37	8:42	8:52	9:22
	9:50	9:55	10:05	10:26
	11:30	11:27	11:27	10:56
	12:30	12:26	12:26	12:26
	14:30	14:35	14:45	14:57
	15:10	15:15	15:25	15:27
	16:30	16:35	16:45	16:56
	18:30	18:35	18:45	19:15
	20:18	20:23	20:33	21:02
	22:30	22:35	22:45	23:15
	Current	10 min	30 min	90 min
Tuesday	6:37	6:42	6:52	7:22
	6:38	8:12	8:22	8:52
	8:37	8:42	8:52	9:22
	9:50	9:55	10:05	10:35
	11:30	11:27	11:26	12:14
	12:30	12:27	12:27	13:11
	14:30	14:26	14:45	14:57
	15:10	15:15	15:25	15:26
	16:30	16:35	16:34	17:05
	18:30	18:25	18:15	18:14
	20:18	20:13	20:29	20:45

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	22:30	22:25	22:45	22:45
	Current	10 min	30 min	90 min
Wednesday	4:37	4:32	4:22	3:51
	6:37	6:35	6:34	7:15
	8:37	8:35	8:35	8:35
	9:50	9:45	9:44	9:14
	11:30	11:25	11:15	10:49
	12:30	12:34	12:35	12:34
	14:30	14:29	14:34	14:34
	15:10	15:14	15:20	15:20
	16:30	16:35	16:34	16:34
	18:30	18:34	18:14	18:34
	20:18	20:13	20:30	20:50
	22:30	22:25	22:44	23:14
	Current	10 min	30 min	90 min
Thursday	4:37	4:32	4:22	3:52
	6:37	6:35	6:35	7:14
	8:37	8:35	8:35	8:15
	9:50	9:45	9:45	9:14
	11:30	11:25	11:15	10:49
	12:30	12:34	12:35	12:34
	14:30	14:34	14:34	14:34
	15:10	15:15	15:19	15:49
	16:30	16:35	16:35	17:14
	18:30	18:25	18:15	18:15
	20:18	20:13	20:29	20:44
	22:30	22:25	22:44	22:44
	Current	10 min	30 min	90 min
Friday	4:37	4:32	4:22	3:52
	6:37	6:35	6:34	7:14
	8:37	8:35	8:34	8:34
	9:50	9:45	9:45	9:15
	11:30	11:25	11:15	10:50
	12:30	12:35	12:35	12:35
	14:30	14:34	14:35	14:35

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	15:10	15:14	15:19	15:19
	16:30	16:34	16:34	16:34
	18:30	18:34	18:14	18:14
	20:18	20:15	20:29	20:50
	22:30	22:25	22:45	23:14
	Current	10 min	30 min	90 min
Saturday	4:37	4:32	4:22	3:51
	6:37	6:31	6:21	7:15
	8:37	8:32	8:29	8:29
	9:50	9:45	9:34	9:15
	11:30	11:25	11:15	11:14
	12:30	12:35	12:35	13:14
	14:30	14:34	14:15	14:44
	15:10	15:14	15:14	15:45
	16:30	16:30	16:29	17:15
	18:30	18:25	18:15	18:04
	20:18	20:15	20:14	20:14
	22:30	22:25	22:15	22:15
	Current	10 min	30 min	90 min
Sunday	4:37	4:31	4:52	3:51
	6:37	6:31	6:21	7:14
	8:37	8:32	8:30	8:30
	9:50	9:45	9:44	10:15
	11:30	11:25	11:15	10:45
	12:30	12:25	12:15	12:14
	14:30	14:30	14:15	13:45
	15:10	15:05	14:55	14:44
	16:30	16:25	16:15	16:14
	18:30	18:25	18:14	17:45
	20:18	20:13	20:03	19:33
	22:30	22:25	22:15	22:14
	From Volos to Larissa			
	Current	10 min	30 min	90 min
Monday	5:30	5:24	5:15	4:45
	7:30	7:35	7:44	8:15

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	8:30	8:35	8:44	8:57
	10:25	10:29	10:12	10:45
	11:20	11:25	11:27	11:27
	12:25	12:27	12:27	12:27
	13:40	13:45	13:55	12:56
	15:25	15:30	15:40	16:04
	17:25	17:30	17:29	17:57
	19:25	19:30	19:40	18:56
	21:25	21:30	21:40	22:10
	23:35	23:40	23:50	0:20
	Current	10 min	30 min	90 min
Tuesday	7:30	7:35	7:45	7:57
	7:31	8:05	8:15	8:42
	8:30	8:35	8:45	9:12
	10:25	10:20	10:10	10:00
	11:20	11:25	11:35	11:57
	12:25	12:27	12:27	13:10
	13:40	13:45	13:55	13:57
	15:25	15:29	15:34	16:05
	17:25	17:30	17:30	17:45
	19:25	19:20	19:39	19:39
	21:25	21:30	21:29	21:29
	23:35	23:30	23:20	23:14
	Current	10 min	30 min	90 min
Wednesday	5:30	5:27	5:27	4:45
	7:30	7:24	7:45	8:14
	8:30	8:35	8:35	8:55
	10:25	10:20	10:10	9:59
	11:20	11:15	11:05	11:50
	12:25	12:20	12:15	12:49
	13:40	13:35	13:29	14:14
	15:25	15:30	15:35	16:04
	17:25	17:30	17:29	17:29
	19:25	19:20	19:09	18:40
	21:25	21:30	21:29	21:29

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	23:35	23:30	23:20	23:14
	Current	10 min	30 min	90 min
Thursday	5:30	5:27	5:27	4:45
	7:30	7:24	7:45	7:45
	8:30	8:35	8:35	8:35
	10:25	10:20	10:10	10:00
	11:20	11:15	11:05	11:50
	12:25	12:20	12:15	12:49
	13:40	13:35	13:30	14:14
	15:25	15:30	15:34	16:04
	17:25	17:19	17:14	17:29
	19:25	19:20	19:10	18:40
	21:25	21:30	21:30	21:14
	23:35	23:30	23:20	23:15
	Current	10 min	30 min	90 min
Friday	5:30	5:27	5:27	4:45
	7:30	7:24	7:45	7:45
	8:30	8:35	8:34	8:34
	10:25	10:20	10:10	9:59
	11:20	11:15	11:05	11:49
	12:25	12:20	12:14	12:50
	13:40	13:35	13:29	13:29
	15:25	15:30	15:35	15:34
	17:25	17:20	17:14	16:44
	19:25	19:30	19:35	18:40
	21:25	21:30	21:30	21:00
	23:35	23:30	23:20	23:15
	Current	10 min	30 min	90 min
Saturday	5:30	5:24	5:14	4:45
	7:30	7:24	7:14	8:14
	8:30	8:25	8:15	9:15
	10:25	10:20	10:10	9:49
	11:20	11:15	11:05	10:59
	12:25	12:20	12:15	12:15
	13:40	13:34	13:25	12:55

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	15:25	15:20	15:10	16:04
	17:25	17:20	17:15	17:15
	19:25	19:30	19:29	18:39
	21:25	21:29	21:29	20:50
	23:35	23:30	23:20	22:50
	Current	10 min	30 min	90 min
Sunday	5:30	5:24	5:14	6:12
	7:30	7:24	7:14	6:44
	8:30	8:24	8:14	7:57
	10:25	10:20	10:10	9:50
	11:20	11:14	11:27	10:35
	12:25	12:20	12:15	12:14
	13:40	13:35	13:25	12:55
	15:25	15:20	15:10	15:10
	17:25	17:20	17:15	17:14
	19:25	19:29	19:29	19:44
	21:25	21:29	21:29	21:29
	23:35	23:30	23:20	22:50

Table 44: Optimized TRAINOSE schedule for Volos – Larissa line

	Current	± 5min	± 15min	± 45min
Total waiting time	428,178	417,002	400,271	362,315
Av. Waiting time	288	121	119	107
Feasible transitions	34,201	36,848	36,812	36,402

Table 45: Results table Larissa-Volos

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.0261	0		
± 15min	0.0652	0.04	0	
± 45min	0.1538	0.1311	0.095	0

Table 46: Percentage difference of total waiting time between code cases for Larissa-Volos

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In Larissa-Volos results, the reduction is up to 15.4%. More precisely, total waiting time lessened 2.6% between current and 10 minute window case, 6.5% between current and 30 minute window case and 15.4% between current and 90 minute window case. This means a reduction up to almost 66,000 minutes (between current and 90 minute window case) in total waiting time and about 180 minutes in average waiting time.

5.2.13 Larissa – Kalampaka Line

Larissa – Kalampaka Data

Nodes of Larissa – Kalampaka line:

- 0 Larissa (see table 220 in Appendix for KTEL current timetable),
- 1 Karditsa (see table 224 in Appendix for KTEL current timetable),
- 2 Trikala (see table 225 in Appendix for KTEL current timetable).

Larissa – Kalampaka Results

	From Larissa to Kalampaka			
	Current	10 min	30 min	90 min
Monday	4:11	4:13	4:13	4:56
Tuesday	4:11	4:05	3:55	3:26
Wednesday	4:11	4:06	3:56	3:26
Thursday	4:11	4:06	3:56	3:26
Friday	4:11	4:06	3:56	3:26
Saturday	4:11	4:06	3:56	3:26
Sunday	4:11	4:06	3:56	3:26
	From Kalampaka to Larissa			
	Current	10 min	30 min	90 min
Monday	22:04	21:58	21:48	22:39
Tuesday	22:04	21:59	21:49	21:39
Wednesday	22:04	21:59	21:49	21:39
Thursday	22:04	21:59	21:49	21:40
Friday	22:04	21:59	21:49	21:39

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Saturday	22:04	21:59	21:49	21:18
Sunday	22:04	21:59	21:49	21:19

Table 47: Optimized TRAINOSE schedule for Larissa – Kalampaka line

	Current	± 5min	± 15min	± 45min
Total waiting time	878,598	874,313	865,843	843,094
Av. Waiting time	710	706	699	679
Feasible transitions	2,936	2,936	2,936	2,924

Table 48: Results table Larissa-Kalampaka

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.0049	0		
± 15min	0.0145	0.0097	0	
± 45min	0.04	0.0357	0.026	0

Table 49: Percentage difference of total waiting time between code cases for Larissa-Kalampaka. In Larissa-Kalampaka results a reduction up to only 4% is observed. To be more precise, the percentage of decrease is 0.5% between current and 10 minute window case, 1.5% between current and 30 minute window case and 4% between current and 90 minute window case. The last one is equal to a decrease of about 35,000 minutes from the current number of total waiting time and a reduction of 31 minutes in average waiting time respectively.

5.2.14 Alexandroupoli – Dikaia Line

Alexandroupoli – Dikaia Data

Nodes of Alexandroupoli – Dikaia line:

- 0 Alexandroupoli (see table 222 in Appendix for KTEL current timetable),
- 1 Didimoticho (see table 232 in Appendix for KTEL current timetable),
- 2 Orestiada.

Alexandroupoli – Dikaia Line Results

	From Alexandroupoli to Dikaia			
	Current	10min	30min	90min
Monday	7:45	7:50	7:30	7:00

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	14:41	14:36	14:26	15:24
Tuesday	7:45	7:50	7:50	8:04
	14:41	14:36	14:26	15:24
Wednesday	7:45	7:49	7:49	7:49
	14:41	14:36	14:26	15:14
Thursday	7:45	7:49	7:49	7:49
	14:41	14:36	14:26	15:15
Friday	7:45	7:50	7:50	7:50
	14:41	14:36	14:26	15:15
Saturday	7:45	7:40	7:30	7:00
	14:41	14:36	14:26	13:56
Sunday	7:45	7:40	7:30	7:00
	14:41	14:36	14:26	13:56
	From Dikaia to Alexandroupoli			
	Current	10min	30min	90min
Monday	12:39	12:44	12:28	12:28
	19:36	19:41	19:51	20:21
Tuesday	12:39	12:44	12:27	12:27
	19:36	19:41	19:51	20:21
Wednesday	12:39	12:44	12:27	12:27
	19:36	19:41	19:51	20:21
Thursday	12:39	12:44	12:27	12:27
	19:36	19:41	19:51	20:21
Friday	12:39	12:44	12:27	12:27
	19:36	19:41	19:51	20:21

Saturday	12:39	12:44	12:54	13:24
	19:36	19:41	19:51	20:21
Sunday	12:39	12:44	12:54	13:24
	19:36	19:41	19:51	20:21

Table 50: Optimized TRAINOSE schedule for Alexandroupoli – Dikaia line

	Current	± 5min	± 15min	± 45min
Total waiting time	71,080	68,895	67,033	59,360
Av. Waiting time	455	442	430	381
Feasible transitions	680	683	687	674

Table 51: Results table Alexandroupoli-Dikaia

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.03	0		
± 15min	0.0569	0.027	0	
± 45min	0.165	0.138	0.1145	0

Table 52: Percentage difference of total waiting time between code cases for Alexandroupoli-Dikaia

In Alexandroupoli-Dikaia results above a reduction up to 16.5% is observed. More precisely, the percentage of decrease is 3% between current and 10 minute window case, 5.7% between current and 30 minute window case and 16.5% between current and 90 minute window case. The last one percentage is equal to a decrease of about 11,720 minutes from the current total waiting time and a reduction of 74 minutes in average waiting time respectively.

5.2.15 Athens – Lianokladi Line

Athens – Lianokladi Data

Nodes of Athens – Lianokladi line:

- 0 Athens (see table 219 in Appendix for KTEL current timetable),

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- 1 Thiva (see table 233 in Appendix for KTEL current timetable),
- 2 Lianokladi.

Athens – Lianokladi Results

From Athens To Lianokladi				
	Current	10 min	30 min	90 min
Friday	11:18	11:13	11:03	10:32
	19:17	19:15	19:30	19:59
Sunday	11:18	11:13	11:02	10:33
From Lianokladi To Athens				
	Current	10 min	30 min	90 min
Monday	6:49	6:54	6:36	6:36
Friday	16:42	16:37	16:27	15:57
Sunday	16:42	16:41	16:27	15:57

Table 53: Optimized TRAINOSE schedule for Athens – Lianokladi line

	Current	± 5min	± 15min	± 45min
Total waiting time	1,108,842	1,105,372	1,086,855	1,038,398
Av. Waiting time	793	790	778	745
Feasible transitions	1,943	1,941	1,953	1,921

Table 54: Results table Athens-Lianokladi

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.0031	0		
± 15min	0.0198	0.0168	0	
± 45min	0.0635	0.0606	0.0446	0

Table 55: Percentage difference of total waiting time between code cases for Athens-Lianokladi. In Athens-Lianokladi results above, a reduction up to only 6.4% is observed. To be more precise, the percentage of decrease is 0.3% between current and 10 minute window case, 2% between current and 30 minute window case and 6.4% between current and 90 minute window case. The last one is equal to a decrease of about 70,444 minutes from the current number of total waiting time and a reduction of 48 minutes in average waiting time respectively. Despite the fact that the percentage decrease is relatively little, the reduction in minutes of total

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waiting time is some thousands. This is occurred because the total waiting time in current schedule is high and exceeds million minutes. Therefore, a reduction of some thousands minutes is relatively low to the current waiting time.

5.2.16 Lianokladi – Stilida Line

Lianokladi – Stilida Data

Nodes of Lianokladi – Stilida line:

- 0 Lianokladi,
- 1 Lamia (see table 234 in Appendix for KTEL current timetable),
- 2 Stylida.

Lianokladi – Stilida Results

	From Lianokladi To Stylida			
	Current	10min	30min	90min
Monday	5:15	5:20	5:30	6:00
	6:45	6:50	7:00	7:30
	8:15	8:10	8:05	8:05
	11:15	11:10	11:00	10:35
	13:15	13:20	13:05	13:05
	15:15	15:20	15:30	16:00
	18:10	18:05	18:05	18:55
	Current	10min	30min	90min
Tuesday	22:15	22:20	22:30	23:00
	5:15	5:20	5:30	6:00
	6:45	6:50	7:00	7:30
	8:15	8:10	8:05	9:00
	11:15	11:10	11:00	12:00
	13:15	13:20	13:05	13:05
	15:15	15:20	15:30	16:00
	18:10	18:05	18:05	18:55
	22:15	22:20	22:30	23:00
	Current	10min	30min	90min
Wednesday	5:15	5:20	5:30	6:00
	6:45	6:50	7:00	7:30

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	8:15	8:10	8:05	9:00
	11:15	11:10	11:00	12:00
	13:15	13:20	13:05	13:05
	15:15	15:20	15:30	16:00
	18:10	18:05	18:25	18:55
	22:15	22:20	22:30	23:00
	Current	10min	30min	90min
Thursday	5:15	5:20	5:30	6:00
	6:45	6:50	7:00	7:30
	8:15	8:10	8:05	9:00
	11:15	11:10	11:00	12:00
	13:15	13:20	13:05	13:05
	15:15	15:20	15:30	16:00
	18:10	18:05	18:25	18:55
	22:15	22:20	22:30	23:00
	Current	10min	30min	90min
Friday	5:15	5:20	5:30	6:00
	6:45	6:50	7:00	7:30
	8:15	8:10	8:05	9:00
	11:15	11:10	11:00	12:00
	13:15	13:20	13:05	13:05
	15:15	15:20	15:30	16:00
	18:10	18:05	18:25	18:55
	22:15	22:20	22:30	23:00
	Current	10min	30min	90min
Saturday	5:15	5:20	5:30	6:00
	6:45	6:50	7:00	7:30
	8:15	8:10	8:05	9:00
	11:15	11:10	11:00	12:00
	13:15	13:20	13:04	13:05
	15:15	15:20	15:30	16:00
	18:10	18:05	18:25	18:55
	22:15	22:20	22:30	23:00
	Current	10min	30min	90min
Sunday	5:15	5:20	5:30	6:00

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	6:45	6:50	7:00	7:30
	8:15	8:20	8:30	9:00
	11:15	11:10	11:00	12:00
	13:15	13:20	13:30	14:00
	15:15	15:20	15:30	16:00
	18:10	18:05	18:05	18:05
	22:15	22:10	22:00	21:30
From Stylida To Lianokladi				
	Current	10min	30min	90min
Monday	6:07	6:12	6:22	6:52
	7:23	7:28	7:38	8:08
	8:57	8:52	8:42	9:42
	11:57	11:52	11:42	11:12
	13:57	14:02	14:12	14:42
	15:57	15:52	15:42	16:42
	18:57	18:52	18:42	18:12
	Current	10min	30min	90min
Tuesday	22:54	22:59	23:09	23:39
	6:07	6:12	6:22	6:52
	7:23	7:28	7:38	8:08
	8:57	8:52	8:42	9:42
	11:57	11:52	11:42	11:12
	13:57	14:02	14:12	14:42
	15:57	16:02	16:12	16:42
	18:57	18:52	18:42	18:12
	22:54	22:59	23:09	23:39
	Current	10min	30min	90min
Wednesday	6:07	6:12	6:22	6:52
	7:23	7:28	7:38	8:08
	8:57	8:52	8:42	9:42
	11:57	11:52	11:42	11:12
	13:57	14:02	14:12	14:42
	15:57	16:02	16:12	16:42
	18:57	18:52	18:42	18:12
	22:54	22:59	23:09	23:39

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	Current	10min	30min	90min
Thursday	6:07	6:12	6:22	6:52
	7:23	7:28	7:38	8:08
	8:57	8:52	8:42	9:42
	11:57	11:52	11:42	11:12
	13:57	14:02	14:12	14:42
	15:57	16:02	16:12	16:42
	18:57	18:52	18:42	18:12
	22:54	22:59	23:09	23:39
	Current	10min	30min	90min
Friday	6:07	6:12	6:22	6:52
	7:23	7:28	7:38	8:08
	8:57	8:52	8:42	9:42
	11:57	11:52	11:42	11:12
	13:57	14:02	14:12	14:42
	15:57	16:02	16:12	16:42
	18:57	18:52	18:42	18:12
	22:54	22:59	23:09	23:39
	Current	10min	30min	90min
Saturday	6:07	6:12	6:22	6:52
	7:23	7:28	7:38	8:08
	8:57	8:52	8:42	9:42
	11:57	11:52	11:42	11:12
	13:57	14:02	14:12	14:42
	15:57	16:02	16:12	16:42
	18:57	18:52	18:42	18:12
	22:54	22:59	23:09	23:39
	Current	10min	30min	90min
Sunday	6:07	6:12	6:22	6:52
	7:23	7:28	7:38	8:08
	8:57	9:02	9:12	9:42
	11:57	11:52	11:42	11:12
	13:57	14:02	14:12	14:42
	15:57	16:02	16:12	16:42
	18:57	18:52	18:42	19:22

	22:54	22:49	22:39	22:09
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Table 56: Optimized TRAINOSE schedule for Lianokladi – Stilida line

	Current	± 5min	± 15min	± 45min
Total waiting time	29,166	28,811	25,931	23,352
Av. Waiting time	191	188	171	154
Feasible transitions	1,149	1,149	1,149	1,146

Table 57: Results table Lianokladi-Stylida

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.012	0		
± 15min	0.1109	0.1	0	
± 45min	0.1993	0.1895	0.0995	0

Table 58: Percentage difference of total waiting time between code cases for Lianokladi-Stylida

In Lianokladi-Stylida results above a reduction up to 20% is observed. To be more precise, the percentage of decrease is 1.2% between current and 10 minute window case, 11% between current and 30 minute window case and 20% between window current and 90 minute window case. The last one is equal to a decrease of about 6,000 minutes from the current total waiting time and a reduction of 37 minutes in average waiting time respectively. In this occasion, the current total waiting time is about 30,000 minutes and thus a reduction of 6,000 minutes is 20% decrease, as it was referred.

5.2.17 Patra – Rio Line

Patra – Rio Line Data

Nodes of Patra – Rio line:

- 0 Patra (see table 235 in Appendix for KTEL current timetable),
- 1 Rio,
- 2 Agios Vasileios.

Patra – Rio Line Results

	From Patra to Rio			
	Current	10min	30min	90min
Monday	6:34	6:29	6:18	5:49
	7:34	7:29	7:19	6:59

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	8:34	8:29	8:44	7:59
	9:34	9:29	9:45	8:59
	10:34	10:29	10:19	9:59
	11:34	11:29	11:19	11:15
	12:34	12:29	12:18	12:15
	13:34	13:29	13:19	13:15
	14:34	14:29	14:19	14:14
	15:34	15:29	15:44	15:24
	16:34	16:30	16:30	16:30
	17:34	17:29	17:44	17:44
	18:34	18:29	18:44	18:44
	19:34	19:30	19:29	19:44
	20:34	20:29	20:44	20:44
	21:34	21:30	21:30	21:44
	22:34	22:29	22:19	22:44
	Current	10min	30min	90min
Tuesday	6:34	6:29	6:18	5:49
	7:34	7:29	7:19	6:59
	8:34	8:29	8:19	7:59
	9:34	9:29	9:44	9:00
	10:34	10:29	10:19	10:00
	11:34	11:29	11:19	11:15
	12:34	12:29	12:18	12:14
	13:34	13:29	13:19	13:14
	14:34	14:29	14:19	14:15
	15:34	15:29	15:45	15:24
	16:34	16:30	16:29	16:29
	17:34	17:29	17:45	17:45
	18:34	18:29	18:44	18:45
	19:34	19:30	19:30	19:45
	20:34	20:29	20:45	20:45
	21:34	21:30	21:29	21:45
	22:34	22:29	22:19	22:45
	Current	10min	30min	90min
Wednesday	6:34	6:29	6:18	5:49

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	7:34	7:29	7:19	7:00
	8:34	8:29	8:19	8:00
	9:34	9:29	9:44	9:00
	10:34	10:29	10:19	10:00
	11:34	11:29	11:19	11:14
	12:34	12:29	12:18	12:15
	13:34	13:29	13:19	13:15
	14:34	14:29	14:19	14:14
	15:34	15:29	15:45	15:25
	16:34	16:30	16:29	16:29
	17:34	17:29	17:44	17:44
	18:34	18:29	18:45	18:44
	19:34	19:30	19:29	19:44
	20:32	20:29	20:45	20:44
	21:34	21:30	21:29	21:44
	22:34	22:29	22:19	22:44
	Current	10min	30min	90min
Thursday	6:34	6:29	6:18	5:49
	7:34	7:29	7:19	6:59
	8:34	8:29	8:19	7:59
	9:34	9:29	9:45	8:59
	10:34	10:29	10:19	9:59
	11:34	11:29	11:19	11:14
	12:34	12:29	12:18	12:14
	13:34	13:29	13:19	13:14
	14:34	14:29	14:19	14:14
	15:34	15:29	15:44	15:24
	16:34	16:30	16:30	16:30
	17:34	17:29	17:44	17:44
	18:34	18:29	18:45	18:44
	19:34	19:30	19:29	19:44
	20:34	20:29	20:44	20:44
	21:34	21:30	21:30	21:44
	22:34	22:29	22:19	22:44
	Current	10min	30min	90min

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

Friday	6:34	6:29	6:18	5:49
	7:34	7:29	7:19	6:59
	8:34	8:29	8:44	7:59
	9:34	9:29	9:45	8:59
	10:34	10:29	10:19	9:59
	11:34	11:29	11:19	11:15
	12:34	12:29	12:18	12:14
	13:34	13:29	13:19	13:14
	14:34	14:29	14:19	14:14
	15:34	15:29	15:44	15:24
	16:34	16:30	16:29	16:29
	17:34	17:29	17:45	17:45
	18:34	18:29	18:44	18:45
	19:34	19:30	19:30	19:45
	20:34	20:29	20:44	20:45
	21:34	21:30	21:30	21:45
	22:34	22:29	22:19	22:45
	Current	10min	30min	90min
Saturday	6:34	6:29	6:19	5:49
	7:34	7:29	7:19	6:48
	8:34	8:30	8:29	8:09
	9:34	9:29	9:44	9:09
	10:34	10:35	10:35	10:09
	11:34	11:29	11:19	11:14
	12:34	12:29	12:45	12:44
	13:34	13:29	13:44	13:44
	14:34	14:29	14:19	14:44
	15:34	15:29	15:45	15:44
	16:34	16:30	16:29	16:45
	17:34	17:29	17:44	17:45
	18:34	18:29	18:45	18:45
	19:34	19:30	19:29	19:45
	20:34	20:29	20:45	20:45
	21:34	21:30	21:29	21:45
	22:34	22:29	22:19	22:45

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	Current	10min	30min	90min
Sunday	6:34	6:29	6:19	5:49
	7:34	7:29	7:19	6:49
	8:34	8:29	8:19	7:48
	9:34	9:29	9:19	9:00
	10:34	10:29	10:25	10:25
	11:34	11:29	11:19	11:25
	12:34	12:29	12:44	12:44
	13:34	13:29	13:45	13:44
	14:34	14:29	14:19	14:44
	15:34	15:29	15:44	15:44
	16:34	16:30	16:30	16:44
	17:34	17:29	17:44	17:44
	18:34	18:29	18:45	18:44
	19:34	19:30	19:29	19:44
	20:34	20:29	20:44	20:44
	21:34	21:30	21:29	21:44
	22:34	22:29	22:19	22:44
From Rio To Patra				
	Current	10min	30min	90min
Monday	7:01	7:06	6:54	6:24
	8:01	8:06	8:16	7:24
	9:01	9:06	8:54	8:24
	10:01	10:06	10:16	9:24
	11:01	11:06	11:14	10:24
	12:01	12:06	11:54	11:24
	13:01	13:06	13:09	12:24
	14:01	14:06	14:16	13:24
	15:01	15:06	14:54	14:24
	16:01	16:06	16:16	15:24
	17:01	17:06	17:16	16:24
	18:01	18:04	18:04	17:24
	19:01	19:06	19:16	18:24
	20:01	20:04	20:04	19:24
	21:01	21:06	21:16	20:24

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	22:01	22:06	22:16	22:46
	23:01	23:06	23:16	23:46
	Current	10min	30min	90min
Tuesday	7:01	7:06	6:54	6:24
	8:01	8:06	8:16	7:24
	9:01	9:06	8:54	8:24
	10:01	10:06	10:16	9:24
	11:01	11:06	11:14	10:24
	12:01	12:06	11:53	11:24
	13:01	13:06	13:09	12:24
	14:01	14:06	14:16	13:24
	15:01	15:06	14:54	14:24
	16:01	16:06	4:01	15:24
	17:01	17:06	17:16	16:24
	18:01	18:04	18:04	17:23
	19:01	19:06	19:16	18:23
	20:01	20:04	20:04	19:24
	21:01	21:06	21:16	20:24
	22:01	22:06	22:16	22:46
	23:01	23:06	23:16	23:46
	Current	10min	30min	90min
Wednesday	7:01	7:06	6:54	6:24
	8:01	8:06	8:16	7:24
	9:01	9:06	8:54	8:24
	10:01	10:06	10:16	9:24
	11:01	11:06	11:14	10:24
	12:01	12:06	11:54	11:24
	13:01	13:06	13:09	12:24
	14:01	14:06	14:16	13:24
	15:01	15:06	14:54	14:24
	16:01	16:06	16:16	15:24
	17:01	17:06	17:16	16:24
	18:01	18:04	18:03	17:23
	19:01	19:06	19:16	18:23
	20:01	20:04	20:04	19:24

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	21:01	21:06	21:16	20:24
	22:01	22:06	22:16	22:46
	23:01	23:06	23:16	23:46
	Current	10min	30min	90min
Thursday	7:01	7:06	6:54	6:24
	8:01	8:06	8:16	7:24
	9:01	9:06	8:54	8:24
	10:01	10:06	10:16	9:24
	11:01	11:06	11:14	10:24
	12:01	12:06	11:54	11:24
	13:01	13:06	13:09	12:24
	14:01	14:06	14:16	13:24
	15:01	15:06	14:54	14:24
	16:01	16:06	16:16	15:24
	17:01	17:06	17:16	16:24
	18:01	18:04	18:04	17:24
	19:01	19:06	19:16	18:24
	20:01	20:04	20:04	19:24
	21:01	21:06	21:16	20:24
	22:01	22:06	22:16	22:46
	23:01	23:06	23:16	23:46
	Current	10min	30min	90min
Friday	7:01	7:06	6:53	6:23
	8:01	8:06	8:16	7:23
	9:01	9:06	8:54	8:23
	10:01	10:06	10:16	9:23
	11:01	11:06	11:14	10:23
	12:01	12:06	11:54	11:23
	13:01	13:06	13:09	12:23
	14:01	14:06	14:16	13:23
	15:01	15:06	14:54	14:24
	16:01	16:06	16:16	15:24
	17:01	17:06	17:16	16:24
	18:01	18:04	18:04	17:24
	19:01	19:06	19:16	18:24

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	20:01	20:04	20:03	19:23
	21:01	21:06	21:16	20:24
	22:01	22:06	22:16	22:46
	23:01	23:06	23:16	23:46
	Current	10min	30min	90min
Saturday	7:01	7:06	6:54	6:23
	8:01	8:06	8:16	7:23
	9:01	9:06	8:54	8:23
	10:01	10:06	10:16	9:23
	11:01	11:06	11:16	10:23
	12:01	12:06	11:54	11:23
	13:01	13:06	13:09	12:23
	14:01	14:06	14:16	13:23
	15:01	15:06	15:16	14:23
	16:01	16:06	16:16	15:23
	17:01	17:06	17:16	16:23
	18:01	18:04	18:04	17:24
	19:01	19:06	19:16	18:24
	20:01	20:04	20:03	19:23
	21:01	21:06	21:16	20:23
	22:01	22:06	22:16	22:46
	23:01	23:06	23:16	23:46
	Current	10min	30min	90min
Sunday	7:01	7:06	7:16	7:24
	8:01	8:06	8:16	8:24
	9:01	9:06	8:54	9:24
	10:01	10:06	10:16	10:24
	11:01	11:06	11:16	11:24
	12:01	12:06	12:16	12:24
	13:01	13:06	13:09	13:24
	14:01	14:06	14:16	14:24
	15:01	15:06	15:16	15:23
	16:01	16:06	16:16	16:23
	17:01	17:06	17:16	17:24
	18:01	18:04	18:04	18:24

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	19:01	19:06	19:16	19:46
	20:01	20:06	20:16	20:46
	21:01	21:06	21:16	21:46
	22:01	22:06	22:16	22:46
	23:01	23:06	23:16	23:46

Table 59: Optimized TRAINOSE schedule for Patra – Rio line

	Current	± 5min	± 15min	± 45min
Total waiting time	48,388	45,869	38,065	33,437
Av. Waiting time	93	89	73	65
Feasible transitions	10,333	10,333	10,311	10,277

Table 60: Results table Patra-Rio

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.052	0		
± 15min	0.2133	0.17	0	
± 45min	0.309	0.271	0.1216	0

Table 61: Percentage difference of total waiting time between code cases for Patra-Rio

In Patra-Rio results a reduction up to 31% is observed. To be more precise, the percentage of decrease is 5.2% between current and 10 minute window case, 21.3% between current and 30 minute window case and 30.9% between current and 90 minute window case. The last one is equal to a decrease of about 15,000 minutes from the current total waiting time and a reduction of 28 minutes in average waiting time respectively. A reduction of 15,000 minutes of total waiting time in a schedule where the current total waiting time is about 48,000 minutes is relatively significant.

5.2.18 Kiato – Patra Line

Kiato – Patra Line Data

Nodes of Kiato – Patra line:

- 0 Kiato,
- 1 Aigio,
- 2 Patra (see table 219 in Appendix for KTEL current timetable).

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

Kiato – Patra Line Results

	From Kiato to Patra			
	Current	10min	30min	90min
Monday	7:30	7:35	7:45	7:45
	8:30	8:35	8:45	8:54
	9:30	9:35	0:55	9:54
	10:30	10:35	10:35	10:54
	12:30	12:35	12:45	11:54
	13:30	13:35	13:35	12:54
	14:30	14:35	14:45	13:54
	15:30	15:35	15:15	14:54
	16:30	16:35	16:45	15:54
	17:30	17:35	17:15	16:54
	18:30	18:25	18:24	17:54
	19:30	19:35	19:15	18:55
	20:30	20:35	20:45	21:15
	Current	10min	30min	90min
Tuesday	7:30	7:35	7:45	7:44
	8:30	8:35	8:45	8:55
	9:30	9:35	9:45	9:55
	10:30	10:35	10:35	10:55
	12:30	12:35	12:45	11:55
	13:30	13:35	13:35	12:55
	14:30	14:35	14:45	13:55
	15:30	15:35	15:15	14:55
	16:30	16:35	16:45	15:55
	17:30	17:35	17:15	16:55
	18:30	18:24	18:24	17:54
	19:30	19:35	19:15	18:55
	20:30	20:35	20:45	21:15
	Current	10min	30min	90min
Wednesday	7:30	7:35	7:45	7:44
	8:30	8:35	8:45	9:15
	9:30	9:35	9:45	10:15
	10:30	10:35	10:34	11:15

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	12:30	12:35	12:45	12:15
	13:30	13:35	13:35	13:15
	14:30	14:35	14:45	14:15
	15:30	15:35	15:15	15:15
	16:30	16:35	16:45	16:15
	17:30	17:35	17:15	17:15
	18:30	18:35	18:45	18:15
	19:30	19:35	19:15	19:15
	20:30	20:35	20:45	21:15
	Current	10min	30min	90min
Thursday	7:30	7:35	7:45	6:45
	8:30	8:35	8:45	7:45
	9:30	9:35	9:45	8:54
	10:30	10:35	10:45	9:55
	12:30	12:35	12:45	12:15
	13:30	13:35	13:35	13:15
	14:30	14:35	14:45	14:15
	15:30	15:35	15:15	15:15
	16:30	16:35	16:45	16:15
	17:30	17:35	17:15	17:15
	18:30	18:35	18:45	18:15
	19:30	19:35	19:15	19:15
	20:30	20:35	20:45	21:15
	Current	10min	30min	90min
Friday	7:30	7:35	7:44	7:44
	8:30	8:35	8:45	9:04
	9:30	9:35	9:45	10:04
	10:30	10:35	10:45	11:15
	12:30	12:35	12:15	12:15
	13:30	13:35	13:35	13:15
	14:30	14:35	14:45	14:15
	15:30	15:35	15:15	15:15
	16:30	16:35	16:45	16:15
	17:30	17:35	17:15	17:15
	18:30	18:35	18:45	18:15

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	19:30	19:35	19:15	19:15
	20:30	20:35	20:45	21:15
	Current	10min	30min	90min
Saturday	7:30	7:35	7:45	7:45
	8:30	8:35	8:45	8:54
	9:30	9:35	9:45	9:54
	10:30	10:35	10:35	10:54
	12:30	12:35	12:15	11:54
	13:30	13:35	13:45	12:54
	14:30	14:35	14:45	13:54
	15:30	15:35	15:15	14:54
	16:30	16:35	16:45	15:54
	17:30	17:35	17:15	16:54
	18:30	18:25	18:25	17:54
	19:30	19:35	19:15	18:55
	20:30	20:35	20:45	21:15
	Current	10min	30min	90min
Sunday	7:30	7:35	7:15	7:15
	8:30	8:35	8:45	9:00
	9:30	9:35	9:14	10:00
	10:30	10:35	10:45	11:00
	12:30	12:35	12:45	12:00
	13:30	13:35	13:45	13:04
	14:30	14:35	14:45	14:14
	15:30	15:35	15:15	15:14
	16:30	16:35	16:45	16:44
	17:30	17:35	17:15	18:15
	18:30	18:35	18:45	19:15
	19:30	19:35	20:55	20:15
	20:30	20:35	20:45	21:15
	From Patra to Kiato			
	Current	10min	30min	90min
Monday	5:30	5:25	5:15	4:45
	6:15	6:10	6:00	5:44
	7:30	7:25	7:15	6:45

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	8:30	8:25	8:15	7:45
	9:45	9:40	9:30	9:00
	11:30	11:25	11:15	10:45
	12:30	12:25	12:15	11:45
	13:30	13:25	13:15	12:44
	14:15	14:10	14:00	13:44
	15:30	15:25	15:24	15:24
	16:30	16:25	16:15	16:24
	17:15	17:10	17:24	17:25
	18:30	18:25	18:15	18:25
	Current	10min	30min	90min
Tuesday	5:30	5:25	5:15	4:44
	6:15	6:10	6:00	5:45
	7:30	7:25	7:15	6:45
	8:30	8:25	8:15	7:45
	9:45	9:40	9:54	9:54
	11:30	11:25	11:15	10:54
	12:30	12:25	12:15	11:54
	13:30	13:25	13:15	12:54
	14:15	14:10	14:00	13:55
	15:30	15:25	15:24	15:25
	16:30	16:25	16:15	16:25
	17:15	17:10	17:25	17:25
	18:30	18:25	18:15	18:25
	Current	10min	30min	90min
Wednesday	5:30	5:25	5:15	4:44
	6:15	6:10	6:00	5:45
	7:30	7:25	7:15	6:45
	8:30	8:25	8:15	7:45
	9:45	9:40	9:54	9:54
	11:30	11:25	11:15	10:54
	12:30	12:25	12:15	11:54
	13:30	13:25	13:15	12:54
	14:15	14:10	14:00	13:55
	15:30	15:25	15:25	15:25

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	16:30	16:25	16:15	16:25
	17:15	17:10	17:25	17:25
	18:30	18:25	18:15	18:25
	Current	10min	30min	90min
Thursday	5:30	5:25	5:14	4:44
	6:15	6:10	6:00	5:44
	7:30	7:25	7:15	6:59
	8:30	8:25	8:15	8:59
	9:45	9:45	9:55	9:59
	11:30	11:25	11:15	11:14
	12:30	12:25	12:14	12:14
	13:30	13:25	13:15	13:14
	14:15	14:10	14:00	14:14
	15:30	15:25	15:24	15:24
	16:30	16:30	16:30	16:30
	17:15	17:10	17:24	17:30
	18:30	18:25	18:45	18:44
	Current	10min	30min	90min
Friday	5:30	5:25	5:14	4:44
	6:15	6:10	6:00	5:45
	7:30	7:25	7:15	6:59
	8:30	8:25	8:15	8:59
	9:45	9:45	9:54	9:59
	11:30	11:25	11:15	10:59
	12:30	12:25	12:15	11:59
	13:30	13:25	13:15	12:59
	14:15	14:10	14:00	13:59
	15:30	15:25	15:25	15:24
	16:30	16:30	16:30	16:29
	17:15	17:10	17:24	17:29
	18:30	18:25	18:44	18:44
	Current	10min	30min	90min
Saturday	5:30	5:25	5:15	4:45
	6:15	6:10	6:00	5:44
	7:30	7:25	7:15	6:45

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	8:30	8:25	8:15	8:09
	9:45	9:45	9:44	9:44
	11:30	11:25	11:15	10:45
	12:30	12:25	12:44	11:45
	13:30	13:25	13:24	12:45
	14:15	14:10	14:00	13:45
	15:30	13:25	15:25	15:25
	16:30	16:30	16:29	16:29
	17:15	17:10	17:25	17:29
	18:30	18:25	18:45	18:45
	Current	10min	30min	90min
Sunday	5:30	5:25	5:15	4:45
	6:15	6:10	6:00	5:44
	7:30	7:25	7:15	7:59
	8:30	8:25	8:15	8:59
	9:45	9:40	9:30	10:25
	11:30	11:25	11:15	11:25
	12:30	12:25	12:44	12:25
	13:30	13:25	13:25	13:25
	14:15	14:10	14:00	14:25
	15:30	15:25	15:25	15:25
	16:30	16:30	16:30	16:30
	17:15	17:10	17:24	17:30
	18:30	18:25	18:15	18:30

Table 62: Optimized TRAINOSE schedule for Kiato – Patra line

	Current	± 5min	± 15min	± 45min
Total waiting time	130,835	127,265	113,310	106,245
Av. Waiting time	283	275	245	230
Feasible transitions	6,723	6,726	6,769	6,739

Table 63: Results table Kiato-Patra

	Current	± 5min	± 15min	± 45min
Current	0			
± 5min	0.027	0		

$\pm 15\text{min}$	0.1339	0.11	0	
$\pm 45\text{min}$	0.1879	0.165	0.0624	0

Table 64: Percentage difference of total waiting time between code cases for Kiato-Patra

In Kiato-Patra results a reduction up to almost 19% is observed. More precisely, the percentage of decrease is 2.7% between current and 10 minute window case, 13.4% between current and 30 minute window case and 18.8% between current and 90 minute window case. The last one reduction is equal to a decrease of about 24,500 minutes from the current total waiting time and a reduction of 53 minutes in average waiting time respectively.

5.3 Intercity Bus Network Results

5.3.1 Section A: Bus-To-Bus Synchronization

In this part, synchronization takes place only between bus lines of one particular prefecture. All the destinations are divided in synchronizing and constant routes as previously described. The synchronizing ones are presented below. The resulted schedules are for:

- Fully relaxed case,
- 30 minute window or ± 15 minutes case,
- 60 minute window or ± 30 minutes case,
- 90 minute window or ± 45 minutes case,
- 120 minute window or ± 60 minutes case.

Fully relaxed case means optimization without time bounds for the new departure time that will be set in relation to the current departure time. In other words, nor time window neither a range of time is set for the departure time. The resulted departure time aroused from the constraints of the model, referred to the waiting time only. The city that plays the role of intermediate node in each section below is the city from where the majority of routes starts or finishes, thus the name of each section. The resulted waiting time and percentage difference of waiting time between the aforementioned cases of each section is referred to the whole section and not to every single synchronized route. This action not only leads to the same results, but also gives the opportunity to present them by grouping routes together according to the prefecture or a central KTEL station.

5.3.1.1 Thiva Destinations Results

Intermediate node: Thiva

Departure time from Thiva to Mavromati					
Day	Variation				
	Fully relaxed	±15min	±30min	±45min	±60min
Monday	8:55	8:00	8:00	8:00	8:00
	12:55	11:30	11:00	10:45	10:40
	16:55	14:30	14:30	13:45	13:30
	20:30	20:30	20:30	20:30	20:30
Tuesday	8:00	8:00	8:00	8:00	8:00
	11:30	11:30	11:00	10:45	10:40
	16:30	14:30	14:30	13:45	13:30
	20:30	20:30	20:30	20:30	20:30
Wednesday	8:00	8:00	8:00	8:00	8:00
	10:40	11:30	11:00	10:45	10:40
	16:30	14:30	14:30	13:45	13:30
	20:30	20:30	20:30	20:30	20:30
Thursday	8:00	8:00	8:00	8:00	8:00
	11:30	11:30	11:00	10:45	10:40
	16:55	14:30	14:30	13:45	13:30
	20:30	20:30	20:30	20:30	20:30
Friday	8:00	8:00	8:00	8:00	8:00
	11:30	11:30	11:00	10:45	10:40
	17:30	14:30	14:30	13:45	13:30
	20:30	20:30	20:30	20:30	20:30
Saturday	12:55	14:30	14:00	13:45	13:30
	20:30	20:15	20:00	19:45	19:30
Sunday	6:00	20:15	20:00	19:45	19:30
Departure time from Mavromati to Thiva					
Day	Variation				

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	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:30	6:25	6:30	6:30	6:30
	12:00	15:15	15:30	15:30	14:00
Tuesday	9:30	6:25	6:30	6:30	6:30
	12:00	15:15	15:30	15:30	14:00
Wednesday	9:30	6:25	6:30	6:30	6:30
	12:00	15:15	15:30	15:30	14:00
Thursday	9:30	6:25	6:30	6:30	6:30
	12:00	15:15	15:30	15:30	14:00
Friday	9:30	6:25	6:30	6:30	6:30
	12:00	15:15	15:30	15:30	14:00
Saturday	17:00	16:15	16:30	16:45	17:00
Sunday	20:00	16:15	16:30	16:45	17:00

Table 65: Optimized KTEL schedule for Thiva– Mavromati line

Thiva-Mavromati							
Departure	Day						Arrival
7:45	1	2	3	4	5		8:15
11:30	1	2	3	4	5		12:00
14:30	1	2	3	4	5	6	15:00
20:30	1	2	3	4	5	6 7	21:00
Mavromati-Thiva							
Departure	Day						Arrival
6:10	1	2	3	4	5		6:40
9:15							9:45
15:00	1	2	3	4	5		15:30
16:00						6 7	16:30

Table 66: Current KTEL schedule for Thiva– Mavromati line

Departure time from Thiva to Asopia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:45	5:45	5:30	5:15	7:00
	14:30	12:00	11:45	11:30	11:30

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	20:30	14:30	14:30	14:30	14:30
Tuesday	9:45	5:45	5:30	5:15	5:00
	13:30	12:00	11:45	11:30	11:30
	20:30	14:30	14:30	14:30	14:30
Wednesday	10:35	5:45	5:30	5:15	5:00
	15:35	12:00	11:45	11:30	11:30
	20:30	14:30	14:30	14:30	14:30
Thursday	9:45	5:45	5:30	5:15	5:00
	14:30	12:00	11:45	11:30	11:30
	20:30	14:30	14:30	14:30	14:30
Friday	8:55	5:45	5:30	5:15	5:00
	13:30	12:00	11:45	11:30	11:15
	20:30	14:00	13:45	13:30	13:15
Saturday	12:55	14:00	13:45	13:30	13:15
Sunday	6:00	14:15	14:00	13:45	13:30
Departure time from Asopia to Thiva					
	Variation				
Day	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:35	7:20	7:20	7:20	8:20
	11:35	8:45	9:00	9:15	9:30
	13:45	15:35	15:35	16:15	16:30
Tuesday	9:35	7:20	7:20	7:20	8:20
	11:35	8:45	9:00	9:15	9:30
	13:45	15:35	15:35	16:15	16:30
Wednesday	9:35	7:20	7:20	7:20	8:20
	11:35	8:45	9:00	9:15	9:30
	13:45	15:35	15:35	16:15	16:30
Thursday	9:35	7:20	7:20	7:20	8:20
	11:35	8:45	9:00	9:15	9:30
	13:35	15:35	15:35	16:15	16:30
Friday	9:35	7:20	7:20	7:20	8:20
	11:35	8:45	9:00	9:15	9:30
	13:35	15:35	15:35	16:15	16:30

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Saturday	14:05	8:45	9:00	9:15	9:30
Sunday	17:05	15:35	15:35	15:35	16:30

Table 67: Optimized KTEL schedule for Thiva– Asopia line

Thiva-Asopia						
Departure	Day					Arrival
6:00	1	2	3	4	5	6:25
12:15	1	2	3	4	5	12:40
14:15	1	2	3	4	5	14:40
14:30						14:55
Asopia-Thiva						
Departure	Day					Arrival
7:20	1	2	3	4	5	7:45
8:30	1	2	3	4	5	8:55
15:30	1	2	3	4	5	15:55

Table 68: Current KTEL schedule for Thiva–Asopia line

Departure time from Thiva to Panagia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	8:55	11:15	11:00	10:45	10:40
	11:30	12:45	12:55	12:55	12:55
	15:35	14:30	14:30	14:30	15:30
	20:30	20:30	20:30	20:30	20:30
Tuesday	8:00	11:15	11:00	10:45	10:40
	11:30	12:45	12:55	12:55	12:55
	16:55	14:30	14:30	14:30	15:30
	20:30	20:30	20:30	20:30	20:30
Wednesday	8:00	11:15	11:00	10:45	10:40
	10:40	12:45	12:55	12:55	12:55
	15:35	14:30	14:30	14:30	15:30
	20:30	20:30	20:30	20:30	20:30
Thursday	8:00	11:15	11:00	10:45	10:40

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	10:40	12:45	12:55	12:55	12:55
	15:35	14:30	14:30	14:30	15:30
	20:30	20:30	20:30	20:30	20:30
Friday	8:00	11:15	11:00	10:45	10:40
	10:40	12:45	12:55	12:55	12:55
	15:35	14:30	14:30	14:30	15:30
	20:30	20:30	20:30	20:30	20:30
Saturday	12:55	14:30	14:00	13:45	13:30
	20:30	20:15	20:00	19:45	19:30
Sunday	6:00	20:15	20:00	19:45	19:30
Departure time from Panagia to Thiva					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:25	7:10	7:10	7:10	7:10
	11:55	15:15	15:25	15:25	15:25
Tuesday	9:25	7:10	7:10	7:10	7:10
	11:55	15:15	15:25	15:25	15:25
Wednesday	9:25	7:10	7:10	7:10	7:10
	11:55	15:15	15:25	15:25	15:25
Thursday	9:25	7:10	7:10	7:10	7:10
	11:55	15:15	15:25	15:25	15:25
Friday	9:25	7:10	7:10	7:10	7:10
	11:55	15:15	15:25	15:25	15:25
Saturday	16:55	16:15	16:30	16:45	16:55
Sunday	19:55	16:15	16:30	16:45	17:00

Table 69: Optimized KTEL schedule for Thiva–Panagia line

Thiva-Panagia									
Departure	Day							Arrival	
11:30	1	2	3	4	5				12:05
12:30	1	2	3	4	5				13:05
14:30	1	2	3	4	5	6			15:05
20:30	1	2	3	4	5	6	7		21:05
Panagia-Thiva									
Departure	Day							Arrival	

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7:00	1	2	3	4	5	7:35
9:00						9:35
15:00	1	2	3	4	5	15:35
16:00					6 7	16:35

Table 70: Current KTEL schedule for Thiva–Panagia line

Departure time from Thiva to Lefktra					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:45	11:15	11:00	10:45	10:40
	12:55	13:55	13:40	13:30	13:30
	16:55	15:45	16:30	16:30	16:55
	20:30	19:55	20:30	20:30	20:30
Tuesday	8:00	11:15	11:00	10:45	10:40
	10:40	13:55	13:40	13:30	13:30
	16:30	15:45	16:30	16:30	16:55
	20:30	19:55	20:30	20:30	20:30
Wednesday	8:00	11:15	11:00	10:45	10:40
	11:30	13:55	13:40	13:30	13:30
	15:35	15:45	16:30	16:30	16:55
	20:30	19:55	20:30	20:30	20:30
Thursday	8:00	11:15	11:00	10:45	10:40
	10:40	13:55	13:40	13:30	13:30
	15:35	15:45	16:30	16:30	16:55
	20:30	19:55	20:30	20:30	20:30
Friday	8:00	11:15	11:00	10:45	10:40
	11:30	13:55	13:40	13:30	13:30
	16:30	15:45	16:30	16:30	16:55
	20:30	19:55	20:30	20:30	20:30
Saturday	6:00	11:15	11:00	10:45	10:40
	8:00	13:55	13:40	13:25	13:10
Departure time from Lefktra to Thiva					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min

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Monday	9:30	7:15	7:15	7:15	8:15
	11:30	12:00	12:00	12:00	12:00
	13:40	16:40	16:55	17:00	17:00
Tuesday	9:30	7:15	7:15	7:15	8:15
	11:30	12:00	12:00	12:00	12:00
	13:40	16:40	16:55	17:00	17:00
Wednesday	9:30	7:15	7:15	7:15	8:15
	11:30	12:00	12:00	12:00	12:00
	13:40	16:40	16:55	17:00	17:00
Thursday	9:30	7:15	7:15	7:15	8:15
	11:30	12:00	12:00	12:00	12:00
	13:30	16:40	16:55	17:00	17:00
Friday	9:30	7:15	7:15	7:15	8:15
	11:30	12:00	12:00	12:00	12:00
	13:30	16:40	16:55	17:00	17:00

Table 71: Optimized KTEL schedule for Thiva–Lefktra line

Thiva-Lefktra								
Departure	Day						Arrival	
11:30	1	2	3	4	5	6	12:00	
14:10	1	2	3	4	5	6	14:40	
16:00	1	2	3	4	5		16:30	
20:00	1	2	3	4	5		20:30	
Lefktra-Thiva								
Departure	Day						Arrival	
7:15	1	2	3	4	5		7:45	
8:00						6	8:30	
11:45	1	2	3	4	5	6	12:15	
16:25	1	2	3	4	5		16:55	

Table 72: Current KTEL schedule for Thiva–Lefktra line

Departure time from Thiva to Kapareli					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:45	11:15	11:00	10:45	10:40
	12:55	13:55	13:40	13:30	13:30

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	16:55	15:45	16:30	16:30	16:55
	20:30	19:55	20:30	20:30	20:30
Tuesday	8:00	11:15	11:00	10:45	10:40
	10:40	13:55	13:40	13:30	13:30
	15:35	15:45	16:30	16:30	16:55
	10:30	19:55	20:30	20:30	20:30
Wednesday	8:00	11:15	11:00	10:45	10:40
	10:40	13:55	13:40	13:30	13:30
	15:35	15:45	16:30	16:30	16:55
	20:30	19:55	20:30	20:30	20:30
Thursday	8:00	11:15	11:00	10:45	10:40
	10:40	13:55	13:40	13:30	13:30
	14:30	15:45	16:30	16:30	16:55
	20:30	19:55	20:30	20:30	20:30
Friday	8:00	11:15	11:00	10:45	10:40
	10:40	13:55	13:40	13:30	13:30
	15:35	15:45	16:30	16:30	16:55
	20:30	19:55	20:30	20:30	20:30
Saturday	6:00	11:15	11:00	10:45	10:40
	8:00	13:55	13:40	13:25	13:10
Departure time from Kapareli to Thiva					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:30	7:15	7:15	7:15	8:15
	11:30	11:45	12:00	12:00	12:00
	13:40	16:30	16:50	17:00	17:00
Tuesday	9:30	7:15	7:15	7:15	8:15
	11:30	11:45	12:00	12:00	12:00
	13:40	16:30	16:50	17:00	17:00
Wednesday	9:30	7:15	7:15	7:15	8:15
	11:30	11:45	12:00	12:00	12:00
	13:40	16:30	16:50	17:00	17:00
Thursday	9:30	7:15	7:15	7:15	8:15

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	11:30	11:45	12:00	12:00	12:00
	13:30	16:30	16:50	17:00	17:00
Friday	9:30	7:15	7:15	7:15	8:15
	11:30	11:45	12:00	12:00	12:00
	13:30	16:30	16:50	17:00	17:00
Saturday	14:00	8:15	8:30	8:45	9:00
	17:00	11:30	12:00	12:00	12:00

Table 73: Optimized KTEL schedule for Thiva–Kapareli line

Thiva-Kapareli							
Departure	Day						Arrival
11:30	1	2	3	4	5	6	12:00
14:10	1	2	3	4	5	6	14:40
16:00	1	2	3	4	5		16:30
20:00	1	2	3	4	5		20:30
Kapareli-Thiva							
Departure	Day						Arrival
7:15	1	2	3	4	5		7:45
8:00						6	8:30
11:30	1	2	3	4	5	6	12:00
16:20	1	2	3	4	5		16:50

Table 74: Current KTEL schedule for Thiva–Kapareli line

Departure time from Thiva to Plataies					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:45	10:40	10:40	9:45	9:45
	13:30	13:55	13:40	13:30	13:30
	20:30	19:55	20:30	20:30	20:30
Tuesday	9:45	10:40	10:40	9:45	9:45
	12:55	13:55	13:40	13:30	13:30
	20:30	19:55	20:30	20:30	20:30
Wednesday	9:45	10:40	10:40	9:45	9:45
	12:55	13:55	13:40	13:30	13:30
	20:30	19:55	20:30	20:30	20:30
Thursday	9:45	10:40	10:39	9:45	9:45

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	13:30	13:55	13:40	13:30	13:30
	20:30	19:55	20:30	20:30	20:30
Friday	9:45	10:40	10:40	9:45	9:45
	12:55	13:55	13:40	13:30	13:30
	20:30	19:55	20:30	20:30	20:30
Saturday	6:00	13:55	13:40	13:25	13:10
Departure time from Plataies to Thiva					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:40	7:25	7:25	7:25	8:30
	11:40	9:05	9:20	9:35	9:40
	13:50	11:05	11:10	11:35	11:50
Tuesday	9:40	7:25	7:25	7:25	8:30
	11:40	9:05	9:20	9:35	9:40
	13:50	11:05	11:10	11:35	11:40
Wednesday	9:40	7:25	7:25	7:25	8:30
	11:40	9:05	9:20	9:35	9:40
	13:50	11:05	11:10	11:35	11:40
Thursday	9:40	7:25	7:25	7:25	8:30
	11:40	9:05	9:20	9:35	9:40
	13:40	11:05	11:10	11:35	11:40
Friday	9:40	7:25	7:25	7:25	8:30
	11:40	9:05	9:20	9:35	9:40
	13:40	11:05	11:10	11:35	11:40
Saturday	17:10	9:05	9:20	9:35	9:40

Table 75: Optimized KTEL schedule for Thiva–Plataies line

Thiva-Plataies							
Departure	Day					Arrival	
10:30	1	2	3	4	5	10:50	
14:10	1	2	3	4	5	6	14:30
20:00	1	2	3	4	5	20:20	
Plataies-Thiva							
Departure	Day					Arrival	
7:30	1	2	3	4	5	7:50	

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8:50	1	2	3	4	5	6	8:10
10:50	1	2	3	4	5		11:10

Table 76: Current KTEL schedule for Thiva– Plataies line

Departure time from Thiva to Neochoraki					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:45	5:45	5:30	5:15	7:00
	14:30	12:00	11:45	11:30	11:30
	20:30	14:30	14:30	14:30	14:30
Tuesday	9:45	5:45	5:30	5:15	5:00
	13:30	12:00	11:45	11:30	11:30
	20:30	14:30	14:30	14:30	14:30
Wednesday	10:35	5:45	5:30	5:15	5:00
	15:35	12:00	11:45	11:30	11:30
	20:30	14:30	14:30	14:30	14:30
Thursday	9:45	5:45	5:30	5:15	5:00
	14:30	12:00	11:45	11:30	11:30
	20:30	14:30	14:30	14:30	14:30
Friday	8:55	5:45	5:30	5:15	5:00
	13:30	12:00	11:45	11:30	11:15
	20:30	14:00	13:45	13:30	13:15
Saturday	12:55	14:00	13:45	13:30	13:15
Sunday	6:00	14:15	14:00	13:45	13:30
Departure time from Neochoraki to Thiva					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:50	7:35	7:35	7:35	8:30
	11:50	9:00	9:15	9:30	9:45
	14:00	15:50	15:50	16:30	16:45
Tuesday	9:50	7:35	7:35	7:35	8:30
	11:50	9:00	9:15	9:30	9:45
	14:00	15:50	15:50	16:30	16:45
Wednesday	9:50	7:35	7:35	7:35	8:30

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	11:50	9:00	9:15	9:30	9:45
	14:00	15:50	15:50	16:30	16:45
Thursday	9:50	7:35	7:35	7:35	8:30
	11:50	9:00	9:15	9:30	9:45
	13:50	15:50	15:50	16:30	16:45
Friday	9:50	7:35	7:35	7:35	8:30
	11:50	9:00	9:15	9:30	9:45
	13:50	15:50	15:50	16:30	16:45
Saturday	14:20	9:00	9:15	9:30	9:45
	17:20	15:50	15:50	15:50	16:45

Table 77: Optimized KTEL schedule for Thiva–Neochoraki line

Thiva-Neochoraki							
Departure	Day					Arrival	
6:00	1	2	3	4	5	6:10	
12:15	1	2	3	4	5	12:25	
14:15	1	2	3	4	5	6	14:25
14:30						7	14:40
Neochoraki-Thiva							
Departure	Day					Arrival	
7:30	1	2	3	4	5	7:40	
8:45	1	2	3	4	5	6	8:55
15:45	1	2	3	4	5	6	15:55

Table 78: Current KTEL schedule for Thiva–Neochoraki line

Departure time from Thiva to Kallithea					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:45	5:45	5:30	5:15	7:00
	14:30	12:00	11:45	11:30	11:30
	20:30	14:30	14:30	14:30	14:30
Tuesday	9:45	5:45	5:30	5:15	5:00
	13:30	12:00	11:45	11:30	11:30
	20:30	14:30	14:30	14:30	14:30
Wednesday	10:35	5:45	5:30	5:15	5:00

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	15:35	12:00	11:45	11:30	11:30
	20:30	14:30	14:30	14:30	14:30
Thursday	9:45	5:45	5:30	5:15	5:00
	14:30	12:00	11:45	11:30	11:30
	20:30	14:30	14:30	14:30	14:30
Friday	8:55	5:45	5:30	5:15	5:00
	13:30	12:00	11:45	11:30	11:15
	20:30	14:00	13:45	13:30	13:15
Saturday	12:55	14:00	13:45	13:30	13:15
Sunday	6:00	14:15	14:00	13:45	13:30
Departure time from Kallithea to Thiva					
	Variation				
Day	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:40	8:55	9:10	9:25	9:40
	12:10	15:40	15:40	16:25	16:40
Tuesday	9:40	8:55	9:10	9:25	9:40
	12:10	15:40	15:40	16:25	16:40
Wednesday	9:40	8:55	9:10	9:25	9:40
	12:10	15:40	15:40	16:25	16:40
Thursday	9:40	8:55	9:10	9:25	9:40
	12:10	15:40	15:40	16:25	16:40
Friday	9:40	8:55	9:10	9:25	9:40
	12:10	15:40	15:40	16:25	16:40
Saturday	14:10	8:55	9:10	9:25	9:40
	17:10	15:40	15:40	16:25	16:40

Table 79: Optimized KTEL schedule for Thiva–Kallithea line

Thiva-Kallithea						
Departure	Day					Arrival
6:00	1	2	3	4	5	6:20
12:15	1	2	3	4	5	12:35
14:15	1	2	3	4	5	14:35
14:30					7	14:50
Kallithea-Thiva						

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Departure	Day						Arrival
7:25							7:45
8:40	1	2	3	4	5	6	9:00
15:40	1	2	3	4	5	6	16:00

Table 80: Current KTEL schedule for Thiva–Kallithea line

Departure time from Thiva to Arma					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	19:55	12:40	12:25	12:10	11:55
Tuesday	19:55	12:40	12:25	12:10	11:55
Wednesday	15:35	12:40	12:25	12:10	11:55
Thursday	12:55	12:40	12:25	12:10	11:55
Friday	6:00	12:40	12:25	12:10	11:55

Departure time from Arma to Thiva					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:35	8:25	8:35	8:55	9:10
Tuesday	9:35	8:25	8:35	8:55	9:10
Wednesday	9:35	8:25	8:35	8:55	9:10
Thursday	9:35	8:25	8:35	8:55	9:10
Friday	9:35	8:25	8:35	8:55	9:10

Table 81: Optimized KTEL schedule for Thiva–Arma line

Thiva-Arma						
Departure	Day					Arrival
12:55	1	2	3	4	5	13:20

Arma-Thiva						
Departure	Day					Arrival
8:10	1	2	3	4	5	8:35

Table 82: Current KTEL schedule for Thiva–Arma line

Departure time from Thiva to Dervenochoria					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min

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Monday	12:55	7:00	7:30	7:35	8:00
	20:30	12:45	12:55	12:55	13:30
Tuesday	12:55	7:00	7:00	7:35	8:00
	20:30	12:45	12:55	12:55	13:30
Wednesday	10:40	7:00	7:00	7:35	8:00
	20:30	12:45	12:55	12:55	13:30
Thursday	10:40	7:00	7:00	7:35	8:00
	20:30	12:45	12:55	12:55	13:30
Friday	6:00	7:00	7:00	6:15	8:00
	8:00	12:15	12:00	11:45	11:30
Departure time from Dervenochoria to Thiva					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	8:50	8:30	8:45	8:50	8:50
	11:20	13:20	13:00	12:50	13:00
Tuesday	8:50	8:30	8:45	8:50	8:50
	11:20	13:20	13:00	12:50	13:00
Wednesday	8:50	8:30	8:45	8:50	8:50
	11:20	13:20	13:00	12:50	13:00
Thursday	8:50	8:30	8:45	8:50	8:50
	11:20	13:20	13:00	12:50	13:00
Friday	8:50	8:30	8:45	8:50	8:50
	11:20	13:20	13:00	12:50	13:00

Table 83: Optimized KTEL schedule for Thiva–Dervenochoria line

Thiva-Dervenochoria						
Departure	Day					Arrival
7:00	1	2	3	4	5	8:10
12:30	1	2	3	4	5	13:40
Dervenochoria-Thiva						
Departure	Day					Arrival
8:15	1	2	3	4	5	9:25
13:30	1	2	3	4	5	14:40

Table 84: Current KTEL schedule for Thiva–Dervenochoria line

Departure time from Thiva to Platanaki
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Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	12:55	7:00	7:30	7:35	8:00
	20:30	13:55	13:40	13:30	13:30
Tuesday	10:40	7:00	7:30	7:35	8:00
	20:30	13:55	13:40	13:30	13:30
Wednesday	10:40	7:00	7:00	7:35	8:00
	20:30	13:55	13:40	13:30	13:30
Thursday	10:40	7:00	7:00	7:35	8:00
	20:30	13:55	13:40	13:30	13:30
Friday	10:40	7:00	7:00	7:35	8:00
	20:30	13:55	13:40	13:30	13:30
Saturday	6:00	6:45	6:30	6:15	6:00
Departure time from Platanaki to Thiva					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:30	7:15	7:15	7:15	8:15
Tuesday	9:30	7:15	7:15	7:15	8:15
Wednesday	9:30	7:15	7:15	7:15	8:15
Thursday	9:30	7:15	7:15	7:15	8:15
Friday	9:30	7:15	7:15	7:15	8:15

Table 85: Optimized KTEL schedule for Thiva–Platanaki line

Thiva-Platanaki							
Departure	Day						Arrival
7:00	1	2	3	4	5	6	7:30
14:10	1	2	3	4	5		14:40
Platanaki-Thiva							
Departure	Day					Arrival	
7:15	1	2	3	4	5		7:45

Table 86: Current KTEL schedule for Thiva–Platanaki line

Departure time from Thiva to N. Kokkino					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min

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Monday	9:45	6:15	7:00	7:00	7:30
	14:30	10:45	10:40	10:40	10:40
	20:30	14:30	14:30	14:30	14:30
Tuesday	10:40	6:15	6:00	5:45	5:30
	20:30	14:30	13:45	13:30	13:30
Wednesday	9:45	6:15	6:00	5:45	5:30
	12:55	10:45	10:40	10:40	10:40
	20:30	14:30	14:30	14:30	14:30
Thursday	11:30	6:15	6:00	5:45	5:30
	20:30	14:30	13:45	13:30	13:30
Friday	6:00	6:15	6:00	5:45	5:30
	8:00	10:45	10:40	10:40	10:40
	10:00	14:00	13:45	13:30	13:15
Departure time from N. Kokkino to Thiva					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:20	7:05	7:05	8:05	8:20
	11:20	11:50	11:50	11:50	11:50
	13:20	16:00	16:15	16:30	16:45
Tuesday	9:20	7:05	7:05	8:05	8:20
	11:50	16:00	16:15	16:30	16:45
Wednesday	9:20	7:05	7:05	8:05	8:20
	11:20	11:50	11:50	11:50	11:50
	13:30	16:00	16:15	16:30	16:45
Thursday	9:20	7:05	7:05	8:05	8:20
	11:50	16:00	16:15	16:30	16:45
Friday	9:20	7:05	7:05	8:05	8:20
	11:20	11:50	11:50	11:50	11:50
	13:20	16:00	16:15	16:30	16:45

Table 87: Optimized KTEL schedule for Thiva–N. Kokkino line

Thiva-N.Kokkino		
Departure	Day	Arrival

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6:30	1	2	3	4	5	7:10
11:00	1		3		5	11:40
14:15	1	2	3	4	5	14:55
N. Kokkino-Thiva						
Departure	Day				Arrival	
7:20	1	2	3	4	5	8:00
11:40	1		3		5	12:20
15:45	1	2	3	4	5	16:25

Table 88: Current KTEL schedule for Thiva–N. Kokkino line

Departure time from Thiva to Saranti						
Day	Variation					
	fully relaxed	±15min	±30min	±45min	±60min	
Monday	12:55	12:15	12:00	11:45	11:30	
	20:30	14:30	14:30	14:30	15:30	
Tuesday	12:55	12:15	12:00	11:45	11:30	
	20:30	14:30	14:30	14:30	15:30	
Wednesday	12:55	12:15	12:00	11:45	11:30	
	20:30	14:30	14:30	14:30	15:30	
Thursday	10:40	12:15	12:00	11:45	11:30	
	20:30	14:30	14:30	14:30	15:30	
Friday	12:55	12:15	12:00	11:45	11:30	
	20:30	14:15	14:00	13:45	13:30	
Saturday	12:55	14:15	14:00	13:45	13:30	
Sunday	6:00	14:15	14:00	13:45	13:30	
Departure time from Saranti to Thiva						
Day	Variation					
	fully relaxed	±15min	±30min	±45min	±60min	
Monday	8:50	7:45	8:00	8:15	8:30	
	11:20	18:45	18:50	18:50	18:50	
Tuesday	8:50	7:45	8:00	8:15	8:30	
	11:20	18:45	18:50	18:50	18:50	
Wednesday	8:50	7:45	8:00	8:15	8:30	
	11:20	18:45	18:50	18:50	18:50	

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Thursday	8:50	7:45	8:00	8:15	8:30
	11:20	18:45	18:50	18:50	18:50
Friday	8:50	7:45	8:00	8:15	8:30
	11:20	18:45	18:50	18:50	18:50
Saturday	16:20	18:45	19:00	19:15	19:20
Sunday	19:20	18:45	19:00	19:15	19:20

Table 89: Optimized KTEL schedule for Thiva–Saranti line

Thiva-Saranti								
Departure	Day							Arrival
12:30	1	2	3	4	5			13:40
14:30	1	2	3	4	5	6	7	15:40
Saranti-Thiva								
Departure	Day							Arrival
7:30	1	2	3	4	5			8:40
18:30	1	2	3	4	5	6	7	19:40

Table 90: Current KTEL schedule for Thiva–Saranti line

Above, the resulted schedules for the fully relaxed, 30 minute window (± 15 min), 60 minute window (± 30 min), 90 minute window (± 45 min) and 120 minute window (± 60 min) case of Thiva destinations were presented. Additionally, the current schedule for every route was presented. Below, the resulted total waiting time and average waiting time will be presented. They are calculated taking into consideration all the optimized routes of Voiotia prefecture and more specifically of Thiva KTEL station, which is used as intermediate node.

	Fully relaxed	± 15min	± 30min	± 45min	± 60min	Current
Total waiting time	552,480	1,094,775	1,042,270	1,004,415	957,370	1,171,170
Av. Waiting time	137	261	249	240	229	279
Feasible transitions	24,735	28,083	27,992	27,792	27,580	28,135

Table 91: Results table Thiva destinations

	Fully relaxed	± 15min	± 30min	± 45min	± 60min	Current
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Fully relaxed	0					
± 15min	-0.982	0				
± 30min	-0.887	0.048	0			
± 45min	-0.818	0.083	0.036	0		
± 60min	-0.733	0.126	0.081	0.047	0	
Current	-1.120	-0.070	-0.124	-0.166	-0.223	0

Table 92: Percentage difference of total waiting time between code variations for Thiva destinations

In the above results of Thiva destinations, a reduction up to 112% is observed. To be more precise, the percentage of decrease is 7% between current and 30 minute window case, 12.4% between current and 60 minute window case and 16.6% between current and 90 minute window case, 22.3% between current and 120 minute window case and 112% between current and fully relaxed case. The last one case is equal to a decrease of about 620,000 minutes from the current total waiting time and a reduction of 142 minutes in average waiting time respectively. This great reduction is occurred because in fully relaxed case the resulted values arise being adjusted to the constant routes only; thus, the current values of synchronizing departure times are not taken into consideration at all.

5.3.1.2 Chalkida Destinations Results

Intermediate node: Chalkida

Departure time from Chalkida to Rovies						
Day	Variation					
	fully relaxed	±15min	±30min	±45min	±60min	
Monday	10:55	8:10	8:10	8:45	9:00	
	17:10	12:15	12:10	13:10	13:10	
	22:55	17:30	17:40	17:40	18:10	
Tuesday	11:30	8:10	8:10	8:10	8:10	
	17:40	12:15	12:10	13:10	13:10	
	23:40	17:30	17:40	17:40	18:10	
Wednesday	11:30	8:10	8:10	8:10	8:10	
	17:40	12:15	12:10	13:10	13:10	
	23:40	17:30	17:40	17:40	18:10	
Thursday	11:40	8:10	8:10	8:10	8:10	

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	17:10	12:15	12:10	13:10	13:10
	22:55	17:30	17:40	17:40	18:10
Friday	10:10	8:10	8:10	8:10	8:10
	15:45	12:15	12:10	13:10	13:10
	22:10	17:30	17:40	17:40	18:10
Saturday	5:00	8:10	7:30	7:15	7:00
	7:05	12:15	12:10	12:10	11:30
	9:10	17:00	16:45	16:30	16:15
Departure time from Rovies to Chalkida					
	Variation				
Day	fully relaxed	±15min	±30min	±45min	±60min
Monday	7:15	6:05	6:15	6:35	4:50
	11:45	11:45	11:45	11:45	11:45
	18:00	16:45	16:00	16:00	16:00
Tuesday	7:15	6:05	6:15	6:35	4:50
	11:45	11:45	11:45	11:45	11:45
	18:00	16:45	16:00	16:00	16:00
Wednesday	7:15	6:05	6:15	6:35	4:50
	11:45	11:45	11:45	11:45	11:45
	18:00	16:45	16:00	16:00	16:00
Thursday	7:15	6:05	6:15	6:35	4:50
	11:45	11:45	11:45	11:45	11:45
	18:00	16:45	16:00	16:00	16:00
Friday	7:15	6:05	6:15	6:35	4:50
	11:45	11:45	11:45	11:45	11:45
	18:00	16:45	16:00	16:00	16:00
Saturday	7:15	11:45	11:45	11:45	11:45
	18:00	16:45	16:00	16:00	16:00

Table 93: Optimized KTEL schedule for Chalkida–Rovies line

Chalkida-Rovies							
Departure	Day						Arrival
8:00	1	2	3	4	5	6	10:15
12:30	1	2	3	4	5	6	14:45

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17:15	1	2	3	4	5	6	19:30
Rovies-Chalkida							
Departure	Day					Arrival	
5:50	1	2	3	4	5		8:05
12:00	1	2	3	4	5	6	14:15
16:30	1	2	3	4	5	6	18:45

Table 94: Current KTEL schedule for Chalkida–Rovies line

Departure time from Chalkida to Karistos					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	13:10	13:10	13:10	13:10	12:10
	22:10	18:30	18:40	19:00	19:10
Tuesday	11:50	12:45	12:30	12:15	12:00
	22:10	18:30	18:40	19:00	19:10
Wednesday	13:10	12:45	12:30	12:15	12:00
	22:55	18:30	18:40	19:00	19:10
Thursday	13:05	12:45	12:30	12:15	12:00
	22:10	18:30	18:40	19:00	19:10
Friday	14:10	12:45	12:30	12:15	12:00
	22:55	18:00	17:45	17:30	17:15
Saturday	17:10	18:00	17:45	17:30	17:15
Sunday	5:00	18:00	17:45	17:30	17:15
Departure time from Karistos to Chalkida					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	6:20	5:45	5:50	6:15	6:20
	10:50	14:00	14:15	14:20	12:50
Tuesday	6:20	5:45	5:50	6:15	6:20
	10:50	14:00	14:15	14:20	12:50
Wednesday	6:20	5:45	5:50	6:15	6:20
	10:50	14:00	14:15	14:20	12:50
Thursday	6:20	5:45	5:50	6:15	6:20
	10:50	14:00	14:15	14:20	12:50

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Friday	10:50	5:45	5:50	6:15	6:20
	17:05	14:00	14:15	14:20	12:50
Sunday	8:05	14:00	14:15	14:20	12:50

Table 95: Optimized KTEL schedule for Chalkida–Karistos line

Chalkida-Karistos								
Departure	Day						Arrival	
13:00	1	2	3	4	5		16:10	
18:15	1	2	3	4	5	6	7	21:25
Karistos-Chalkida								
Departure	Day						Arrival	
5:30	1	2	3	4	5		8:40	
13:45	1	2	3	4	5	7	16:55	

Table 96: Current KTEL schedule for Chalkida–Karistos line

Departure time from Chalkida to Oxilithos						
Day	Variation					
	fully relaxed	±15min	±30min	±45min	±60min	
Monday	20:50	12:00	11:45	11:30	11:15	
Tuesday	20:10	12:00	11:45	11:30	11:15	
Wednesday	19:10	12:00	11:45	11:30	11:15	
Thursday	15:10	12:00	11:45	11:30	11:15	
Friday	5:00	12:00	11:45	11:30	11:15	
Departure time from Oxilithos to Chalkida						
Day	Variation					
	fully relaxed	±15min	±30min	±45min	±60min	
Monday	7:30	7:25	7:30	7:30	7:30	
Tuesday	7:30	7:25	7:30	7:30	7:30	
Wednesday	7:30	7:25	7:30	7:30	7:30	
Thursday	7:30	7:25	7:30	7:30	7:30	
Friday	7:30	7:25	7:30	7:30	7:30	

Table 97: Optimized KTEL schedule for Chalkida–Oxilithos line

Chalkida-Oxilithos							
Departure	Day						Arrival
12:15	1	2	3	4	5		14:15
Oxilithos-Chalkida							

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Departure	Day					Arrival
7:10	1	2	3	4	5	9:10

Table 98: Current KTEL schedule for Chalkida–Oxylithos line

Departure time from Chalkida to Gimno					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	10:55	10:15	10:55	10:55	10:55
	17:10	14:40	15:10	15:10	15:10
	22:55	19:40	20:00	20:10	20:10
Tuesday	11:50	10:15	10:10	10:10	9:30
	20:40	14:40	15:10	15:10	15:10
	23:40	19:40	20:00	20:10	20:10
Wednesday	10:55	10:15	10:10	10:10	9:30
	17:10	14:40	15:10	15:10	15:10
	22:55	19:40	20:00	20:10	20:10
Thursday	10:05	10:15	10:10	10:10	9:30
	15:10	14:40	15:10	15:10	15:10
	22:55	19:40	20:00	20:10	20:10
Friday	11:50	10:15	10:10	10:10	9:30
	17:40	14:40	15:10	15:10	15:09
	23:40	19:40	20:00	20:10	20:09
Saturday	17:40	14:30	14:15	14:00	13:45
Sunday	5:00	14:30	14:15	14:00	13:45
Departure time from Gimno to Chalkida					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	8:30	7:15	7:30	7:30	6:00
	13:00	9:30	9:45	8:30	8:30
Tuesday	8:30	7:15	7:30	7:30	6:00
	13:00	9:30	9:45	8:30	8:30
Wednesday	8:30	7:15	7:30	7:30	6:00
	13:00	9:30	9:45	8:30	8:30
Thursday	8:30	7:15	7:30	7:30	6:00

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	13:00	9:30	9:45	8:30	8:30
Friday	8:30	7:15	7:30	7:30	6:00
	13:00	9:30	9:45	8:30	8:30
Saturday	8:30	7:25	6:40	6:40	6:40
	19:15	9:30	9:30	8:30	8:30

Table 99: Optimized KTEL schedule for Chalkida–Gimno line

Chalkida-Gimno								
Departure	Day							Arrival
10:30	1	2	3	4	5			11:30
14:45	1	2	3	4	5	6	7	15:45
19:30	1	2	3	4	5			20:30
Gimno-Chalkida								
Departure	Day							Arrival
7:00	1	2	3	4	5			8:00
7:10						6		8:10
9:15	1	2	3	4	5	6		10:15

Table 100: Current KTEL schedule for Chalkida–Gimno line

Departure time from Chalkida to Istiaia						
Day	Variation					
	fully relaxed	±15min	±30min	±45min	±60min	
Monday	21:10	14:15	14:00	13:45	13:30	
Tuesday	21:10	14:15	14:00	13:45	13:30	
Wednesday	21:10	14:15	14:00	13:45	13:30	
Thursday	15:10	14:15	14:00	13:45	13:30	
Friday	5:00	14:15	14:00	13:45	13:30	
Departure time from Istiaia to Chalkida						
Day	Variation					
	fully relaxed	±15min	±30min	±45min	±60min	
Monday	6:15	6:15	6:15	6:15	6:15	
Tuesday	6:15	6:15	6:15	6:15	6:15	
Wednesday	6:15	6:15	6:15	6:15	6:15	
Thursday	6:15	6:15	6:15	6:15	6:15	
Friday	6:15	6:15	6:15	6:15	6:15	
Saturday	6:15	6:15	6:15	6:15	6:15	

Sunday	18:55	7:45	8:00	8:00	8:00
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Table 101: Optimized KTEL schedule for Chalkida–Istiaia line

Chalkida-Istiaia							
Departure	Day					Arrival	
14:30	1	2	3	4	5	17:45	
Istiaia-Chalkida							
Departure	Day					Arrival	
6:00	1	2	3	4	5	6	9:15
7:30						7	10:45

Table 102: Current KTEL schedule for Chalkida–Istiaia line

Departure time from Chalkida to Avlonari					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Saturday	5:00	12:00	11:45	11:30	11:15
Departure time from Avlonari to Chalkida					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	8:00	17:55	18:00	18:00	18:40
Tuesday	8:00	17:55	18:00	18:00	18:40
Wednesday	8:00	17:55	18:00	18:00	18:40
Thursday	8:00	17:55	18:00	18:00	18:40
Friday	8:00	17:55	18:00	18:00	18:40
Saturday	8:00	7:55	8:00	8:00	8:00

Table 103: Optimized KTEL schedule for Chalkida–Avlonari line

Chalkida-Avlonari						
Departure	Day					Arrival
12:15					6	13:45
Avlonari-Chalkida						
Departure	Day					Arrival
7:40					6	9:10
17:40	1	2	3	4	5	19:10

Table 104: Current KTEL schedule for Chalkida–Avlonari line

Departure time from Chalkida to Chiliadou					
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Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:00	12:45	12:30	12:15	12:00
Wednesday	5:00	12:45	12:30	12:15	12:00
Friday	5:00	13:45	13:30	13:15	13:00
Departure time from Chiliadou to Chalkida					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	6:50	6:50	6:50	6:50	6:50
Wednesday	6:50	6:50	6:50	6:50	6:50
Friday	6:50	6:50	6:50	6:50	6:50

Table 105: Optimized KTEL schedule for Chalkida–Chiliadou line

Chalkida-Chiliadou				
Departure	Day			Arrival
13:00	1	3		15:40
14:00			5	16:40
Chiliadou-Chalkida				
Departure	Day			Arrival
6:50	1	3	5	9:30

Table 106: Current KTEL schedule for Chalkida–Chiliadou line

Departure time from Chalkida to Thessaloniki					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	22:10	8:45	8:30	8:15	8:00
Tuesday	21:10	8:45	8:30	8:15	8:00
Wednesday	21:10	8:45	8:30	8:15	8:00
Thursday	21:10	8:45	8:30	8:15	8:00
Friday	21:00	15:45	15:45	15:45	15:45
Saturday	15:55	8:45	8:30	8:15	8:00
Sunday	5:00	15:45	15:30	15:15	15:00
Departure time from Thessaloniki to Chalkida					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min

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Monday	3:30	13:15	13:30	12:15	12:15
Tuesday	3:30	13:15	13:30	12:15	12:15
Wednesday	3:30	13:15	13:30	12:15	12:15
Thursday	3:30	13:15	13:30	12:15	12:15
Friday	3:30	16:00	16:00	16:00	16:00
Saturday	3:30	13:15	13:30	12:15	12:15
Sunday	16:10	16:10	16:10	16:10	16:10

Table 107: Optimized KTEL schedule for Chalkida–Thessaloniki line

Chalkida-Thess/Niki								
Departure	Day						Arrival	
9:00	1	2	3	4	-	6	-	15:00
16:00	-	-	-	-	5	-	7	22:00
Thess/Niki-Chalkida								
Departure	Day						Arrival	
13:00	1	2	3	4	-	6	-	19:00
16:00	-	-	-	-	5	-	7	22:00

Table 108: Current KTEL schedule for Chalkida–Thessaloniki line

Departure time from Chalkida to Ioannina					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	22:10	9:45	9:30	9:15	9:00
Tuesday	21:10	9:45	9:30	9:15	9:00
Wednesday	21:10	9:45	9:30	9:15	9:00
Thursday	21:10	9:45	9:30	9:15	9:00
Friday	21:00	9:45	9:30	9:15	9:00
Sunday	15:55	9:45	9:30	9:15	9:00
Departure time from Ioannina to Chalkida					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	2:00	12:00	12:30	12:45	12:45
Tuesday	2:00	12:00	12:30	12:45	12:45
Wednesday	2:00	12:00	12:30	12:45	12:45
Thursday	2:00	12:00	12:30	12:45	12:45
Friday	6:30	12:00	12:30	12:45	12:45

Sunday	3:45	12:00	12:30	12:45	12:45
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Table 109: Optimized KTEL schedule for Chalkida–Ioannina line

Chalkida-Ioannina								
Departure	Day							Arrival
10:00	1	2	3	4	5	-	7	17:30
Ioannina-Chalkida								
Departure	Day							Arrival
12:00	1	2	3	4	5	-	7	19:30

Table 110: Current KTEL schedule for Chalkida–Ioannina line

Departure time from Chalkida to Patra					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	22:10	8:15	8:00	7:45	7:30
Tuesday	21:10	8:15	8:00	7:45	7:30
Wednesday	21:10	8:15	8:00	7:45	7:30
Thursday	21:10	8:15	8:00	7:45	7:30
Friday	21:00	8:15	8:00	7:45	7:30
Sunday	15:55	8:15	8:00	7:45	7:30
Departure time from Patra to Chalkida					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:00	11:30	11:30	11:30	11:30
	9:30	14:45	15:00	13:45	13:45
Tuesday	5:00	11:30	11:30	11:30	11:30
	9:30	14:45	15:00	13:45	13:45
Wednesday	5:00	11:30	11:30	11:00	11:00
	9:30	14:45	15:00	13:45	13:45
Thursday	5:00	11:30	11:30	11:00	11:00
	9:30	14:45	15:00	13:45	13:45
Friday	9:30	14:45	15:00	13:45	13:45
Sunday	6:45	14:45	15:00	13:45	13:45

Table 111: Optimized KTEL schedule for Chalkida–Patra line

Chalkida-Patra								
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Departure	Day							Arrival
8:30	1	2	3	4	5	-	7	13:00
Patra-Chalkida								
Departure	Day						Arrival	
11:30	1	2	3	4	-	-	-	16:00
14:30	1	2	3	4	5	-	7	19:00

Table 112: Current KTEL schedule for Chalkida–Patra line

Above, the resulted schedules for the fully relaxed, 30 minute window (± 15 min), 60 minute window (± 30 min), 90 minute window (± 45 min) and 120 minute window (± 60 min) case of Chalkida destinations were presented. Additionally, the current schedule for every route was presented. Below, the resulted total waiting time and average waiting time will be presented. They are calculated taking into consideration all the optimized routes of Evoia prefecture and more specifically of Chalkida KTEL station, which is used as intermediate node.

	Fully relaxed	± 15 min	± 30 min	± 45 min	± 60 min	Current
Total waiting time	1,618,690	2,971,540	2,900,790	2,841,240	2,746,480	3,074,880
Av. Waiting time	352	590	578	567	550	608
Feasible transitions	20,791	23,507	23,393	23,376	23,350	23,607

Table 113: Results table Chalkida destinations

	Fully relaxed	± 15 min	± 30 min	± 45 min	± 60 min	Current
Fully relaxed	0					
± 15min	-0.836	0				
± 30min	-0.792	0.024	0			
± 45min	-0.755	0.044	0.021	0		
± 60min	-0.697	0.076	0.053	0.033	0	
Current	-0.900	-0.035	-0.060	-0.082	-0.120	0

Table 114: Percentage difference of total waiting time between code variations for Chalkida destinations

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In the above results of Chalkida destinations, a reduction up to 90% is observed. To be more precise, the percentage of decrease is 3.5% between current and 30 minute window case, 6% between current and 60 minute window case, 8.2% between current and 90 minute window case, 12% between current and 120 minute window case and 90% between current and fully relaxed case. The last one case is equal to a decrease of about 1,456,190 minutes from the current total waiting time and a reduction of 256 minutes in average waiting time respectively. This great reduction is occurred because in fully relaxed case the resulted values arise being adjusted to the constant routes only; thus, the current values of synchronizing departure times are not taken into consideration at all.

5.3.1.3 Korinthos Destinations Results

Intermediate node: Korinthos

Departure time from Korinthos to Chiliomodi					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	8:00	6:55	7:25	7:40	8:00
	10:00	9:15	9:00	9:00	9:00
	11:55	10:35	10:40	10:40	10:00
	14:00	11:30	11:55	11:55	11:00
	15:55	13:30	13:30	13:30	12:30
	17:30	14:30	14:55	14:55	14:00
	18:50	15:55	15:55	16:30	15:55
	19:55	17:30	18:00	18:00	18:00
	21:30	20:05	19:55	19:55	19:55
	23:20	21:30	21:30	22:00	22:00
Tuesday	8:00	6:55	6:55	6:55	8:00
	9:30	9:15	9:00	9:00	9:00
	11:00	10:35	10:35	10:35	10:35
	13:30	11:30	11:55	11:55	11:50
	15:29	13:30	13:30	13:30	13:30
	17:30	14:30	14:55	14:55	14:55
	18:50	15:55	15:55	16:30	16:50

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	19:55	17:30	18:00	18:00	18:30
	22:00	20:05	19:55	19:55	19:55
	23:20	21:30	21:50	22:00	22:00
Wednesday	9:00	6:55	6:55	6:55	7:25
	10:55	9:15	9:00	9:00	8:55
	12:30	10:35	10:35	10:35	10:00
	14:00	11:30	11:55	11:55	11:00
	14:55	13:30	13:30	13:30	12:30
	16:30	14:30	14:55	14:55	14:00
	18:30	15:55	15:55	16:30	15:55
	19:55	17:30	18:00	18:00	18:00
	21:30	20:05	19:55	19:55	19:55
	23:20	21:30	21:30	22:00	22:00
Thursday	8:00	6:55	6:55	6:55	7:55
	9:55	9:15	9:00	9:00	9:00
	11:00	10:35	10:35	10:35	10:00
	12:30	11:30	11:55	11:55	11:30
	14:00	13:30	13:30	13:30	12:55
	15:40	14:30	14:55	14:55	14:55
	18:30	15:55	15:55	16:30	16:30
	19:55	17:30	18:00	18:00	18:30
	22:00	20:05	19:55	19:55	19:55
	23:20	21:30	21:30	22:00	22:00
Friday	8:00	6:55	6:55	6:55	8:00
	9:00	9:15	9:00	9:00	9:00
	11:55	10:35	10:35	10:35	10:00
	13:50	11:30	11:55	11:55	11:30
	14:55	13:30	13:30	13:30	13:30
	16:30	14:30	14:55	14:55	14:55
	18:30	15:55	15:55	16:30	16:30
	19:55	17:30	18:00	18:00	18:30
	21:30	20:05	19:55	19:55	19:55

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	23:20	21:30	21:30	22:00	22:00
Saturday	9:55	10:30	10:00	9:55	9:30
	13:30	12:30	12:00	11:55	11:30
	18:50	13:30	14:00	14:00	14:00
	21:30	15:55	15:55	16:30	16:30
	22:30	19:30	19:30	19:30	19:30
	23:25	21:30	21:30	22:00	22:00
Sunday	5:00	12:30	12:00	11:50	11:30
	7:30	15:55	15:55	16:30	16:30
	8:25	21:05	20:50	20:35	20:20
Departure time from Chiliomodi to Korinthos					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	6:00	6:30	6:30	6:30	6:30
	7:00	7:30	7:30	7:30	7:30
	8:00	8:30	8:30	8:30	8:30
	9:00	10:00	9:30	10:00	11:00
	11:15	13:30	13:30	13:30	13:30
	12:10	15:00	15:30	15:30	15:30
	13:05	17:00	16:30	16:30	16:30
	14:00	18:05	18:25	18:30	18:30
	15:30	19:00	19:20	19:30	19:30
Tuesday	6:10	6:30	6:30	6:30	6:30
	7:05	7:30	7:30	7:30	7:30
	8:00	8:30	8:30	8:30	8:30
	9:00	10:00	9:30	10:00	11:00
	10:00	13:30	13:30	13:30	13:30
	11:00	15:00	15:30	15:30	15:30
	12:00	17:00	16:30	16:30	16:30
	13:00	18:05	18:25	18:30	18:30
	15:30	19:00	19:20	19:30	19:30
Wednesday	5:30	6:30	6:30	6:30	6:30
	6:30	7:30	7:30	7:30	7:30

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	7:45	8:30	8:30	8:30	8:30
	8:40	10:00	9:30	10:30	11:00
	9:35	13:30	13:30	13:30	13:30
	10:30	15:00	15:30	15:30	15:30
	11:30	17:00	16:30	16:30	16:30
	13:30	18:05	18:25	18:30	18:30
	15:30	19:00	19:20	19:30	19:30
Thursday	6:00	6:30	6:30	6:30	6:30
	7:00	7:30	7:30	7:30	7:30
	8:30	8:30	8:30	8:30	8:30
	9:30	10:00	9:30	10:30	10:00
	10:30	13:30	13:30	13:30	13:30
	11:30	15:00	15:30	15:30	15:30
	12:30	17:00	16:30	16:30	16:30
	13:30	18:05	18:25	18:30	18:30
15:30	19:00	19:20	19:30	19:30	
Friday	5:30	6:30	6:30	6:30	6:30
	6:30	7:30	7:30	7:30	7:30
	7:30	8:30	8:30	8:30	8:30
	8:30	10:00	9:30	10:30	11:00
	10:30	13:30	13:30	13:30	13:30
	11:30	15:00	15:30	15:30	15:30
	12:30	17:00	16:30	16:30	16:30
	13:30	18:05	18:25	18:30	18:30
15:30	19:00	19:20	19:30	19:30	
Saturday	9:30	6:10	6:00	6:00	7:20
	11:30	7:30	7:30	7:30	8:20
	12:30	13:30	13:30	13:30	12:30
	13:30	17:00	17:30	17:30	16:30
	18:30	19:00	18:30	18:30	18:30
Sunday	21:00	17:00	17:30	16:30	18:00
	21:55	19:00	19:00	19:00	19:00

Table 115: Optimized KTEL schedule for Korinthos–Chiliomodi line

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

Korinthos-Chiliomodi								
Departure	Day							Arrival
7:00	1	2	3	4	5	-	-	7:30
9:30	1	2	3	4	5	-	-	10:00
10:30	1	2	3	4	5	6	-	11:00
11:30	1	2	3	4	5	-	-	12:00
12:30	-	-	-	-	-	6	7	13:00
13:30	1	2	3	4	5	6	-	14:00
14:30	1	2	3	4	5	-	-	15:00
15:50	1	2	3	4	5	6	7	16:20
17:30	1	2	3	4	5	-	-	18:00
19:30	-	-	-	-	-	6	-	20:00
20:20	1	2	3	4	5	-	-	20:50
21:20	1	2	3	4	5	6	7	21:50
Chiliomodi-Korinthos								
Departure	Day							Arrival
6:20	1	2	3	4	5	6	-	6:50
7:20	1	2	3	4	5	6	-	7:50
8:30	1	2	3	4	5	-	-	9:00
10:00	1	2	3	4	5	-	-	10:30
13:30	1	2	3	4	5	6	-	14:00
15:00	1	2	3	4	5	-	-	15:30
17:00	1	2	3	4	5	6	7	17:30
18:20	1	2	3	4	5	-	-	18:50
18:50	1	2	3	4	5	6	7	19:20

Table 116: Current KTEL schedule for Korinthos–Chiliomodi line

Departure time from Korinthos to Klenia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	10:00	9:30	9:00	9:00	9:00
	12:30	11:30	11:00	11:00	11:00
	15:55	13:30	13:00	12:55	13:30
	18:30	14:30	14:55	14:55	15:30
	20:30	17:30	18:00	18:00	18:30
	23:20	20:30	20:50	20:50	20:50

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

Tuesday	9:00	9:15	9:00	8:55	8:55
	11:55	11:30	11:00	11:00	11:00
	14:55	13:30	13:00	12:55	13:30
	17:30	14:30	14:55	14:55	15:30
	19:55	17:30	18:00	18:00	18:00
	22:30	20:30	20:50	20:50	20:50
Wednesday	9:00	9:15	9:00	8:55	8:30
	11:55	11:39	11:00	11:00	10:35
	14:55	13:30	13:00	12:55	12:30
	18:00	14:30	14:55	14:55	14:55
	20:30	17:30	18:00	18:00	18:00
	23:20	20:30	20:50	20:50	20:50
Thursday	9:00	9:15	9:00	8:55	8:30
	12:30	11:30	11:00	11:00	10:35
	15:55	13:30	13:00	12:55	12:30
	18:30	14:30	14:55	14:55	14:55
	20:30	17:30	18:00	18:00	18:00
	22:30	20:30	20:50	20:50	20:50
Friday	5:00	9:15	9:00	8:55	8:30
	6:00	11:30	11:00	11:00	10:35
	6:55	13:30	13:00	12:55	12:30
	8:00	14:30	14:55	14:55	14:55
	8:55	17:30	18:00	18:00	18:30
	9:50	20:30	20:50	20:50	21:20
Sunday	5:00	12:15	12:00	11:45	11:30
Departure time from Klenia to Korinthos					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	8:25	6:25	6:25	6:25	6:25
	9:55	7:25	7:25	7:25	8:25
	11:25	8:25	8:25	8:25	9:25
	12:25	9:55	9:55	9:25	10:55
	13:25	14:55	15:20	15:25	15:25

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	15:25	18:25	18:25	18:25	18:25
Tuesday	6:25	6:25	6:25	6:25	6:25
	8:25	7:25	7:25	7:25	8:25
	9:25	8:25	8:25	8:25	9:25
	11:25	9:55	9:55	9:55	10:55
	13:25	14:55	15:20	15:25	15:25
	15:25	18:25	18:25	18:25	18:25
Wednesday	8:25	6:25	6:25	6:25	6:25
	10:25	7:25	7:25	7:25	8:25
	11:25	8:25	8:25	8:25	9:25
	12:25	9:55	9:55	10:25	10:55
	13:25	14:55	15:20	15:25	15:25
	15:25	18:25	18:25	18:25	18:25
Thursday	6:25	6:25	6:25	6:25	6:25
	8:25	7:25	7:25	7:25	8:25
	11:25	8:25	8:25	8:25	9:25
	12:25	9:55	9:55	10:25	10:25
	13:25	14:55	15:20	15:25	15:25
	15:25	18:25	18:25	18:25	18:25
Friday	6:25	6:25	6:25	6:25	6:25
	8:25	7:25	7:25	7:25	8:25
	11:25	8:25	8:25	8:25	9:25
	12:25	9:55	9:55	10:25	10:25
	13:25	14:55	15:20	15:25	15:25
	15:25	18:25	18:25	18:25	18:25
Saturday	11:25	7:25	7:25	7:25	8:25
	12:25	8:25	8:25	8:25	9:25

Table 117: Optimized KTEL schedule for Korinthos–Klenia line

Korinthos-Klenia								
Departure	Day							Arrival
9:30	1	2	3	4	5	-	-	10:05
11:30	1	2	3	4	5	-	-	12:05
12:30	-	-	-	-	-	-	7	13:05

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

13:30	1	2	3	4	5	-	-	14:05
14:30	1	2	3	4	5	-	-	15:05
17:30	1	2	3	4	5	-	-	18:05
20:20	1	2	3	4	5	-	-	20:55
Klenia-Korinthos								
Departure	Day							Arrival
6:15	1	2	3	4	5	-	-	6:50
7:30	1	2	3	4	5	6	-	8:05
8:25	1	2	3	4	5	6	-	9:00
10:00	1	2	3	4	5	-	-	10:35
14:50	1	2	3	4	5	-	-	15:25
18:20	1	2	3	4	5	-	-	18:55

Table 118: Current KTEL schedule for Korinthos–Klenia line

Departure time from Korinthos to Agios Vasileios					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:30	6:55	7:25	7:40	8:00
	13:30	10:40	10:00	10:00	10:00
	15:55	13:30	13:00	12:55	12:30
	18:30	15:55	15:55	15:55	15:55
	20:30	19:30	18:50	19:30	19:30
	23:20	21:30	21:30	22:00	22:00
Tuesday	9:00	6:55	7:25	7:40	8:00
	11:55	10:35	10:00	10:00	11:00
	14:55	13:30	13:00	12:55	14:00
	17:30	15:55	15:55	15:55	16:50
	19:55	19:30	18:50	19:30	19:30
	23:20	21:30	21:50	22:00	22:00
Wednesday	10:00	6:55	7:25	7:40	8:00
	12:55	10:35	10:00	10:00	10:55
	15:55	13:30	13:00	12:55	13:30
	18:30	15:55	15:55	15:55	15:55
	20:30	19:30	18:50	19:30	19:30
	23:20	21:30	21:30	22:00	22:00

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

Thursday	9:00	6:55	7:25	7:40	8:00
	11:55	10:35	10:00	10:00	11:00
	14:55	13:30	13:00	12:55	14:00
	18:00	15:55	15:55	15:55	16:30
	20:30	19:30	18:50	19:30	19:30
	23:20	21:30	21:30	22:00	22:00
Friday	9:00	6:55	7:25	7:40	8:00
	11:30	10:35	10:00	10:00	11:00
	14:50	13:30	13:00	12:55	13:30
	18:00	15:55	15:55	15:55	15:55
	20:30	19:30	18:50	19:30	19:30
	23:20	21:30	21:30	22:00	22:00
Saturday	9:55	10:30	10:00	9:55	9:30
	12:55	12:30	12:00	11:55	11:30
	15:40	13:30	14:00	14:00	14:00
	19:30	15:55	15:55	16:30	16:30
	21:30	19:30	19:30	19:30	19:30
	23:20	21:30	21:30	22:00	22:00
Sunday	5:00	12:30	12:00	11:50	11:30
	6:35	15:55	15:30	15:30	15:30
	7:30	19:10	18:50	18:35	18:30
	8:25	21:05	20:50	20:35	20:20
Departure time from Agios Vasileios to Korinthos					
	Variation				
Day	fully relaxed	±15min	±30min	±45min	±60min
Monday	6:00	6:00	6:20	6:20	6:20
	8:20	7:20	7:20	7:20	7:20
	9:20	8:20	8:20	8:20	8:20
	11:20	10:20	10:20	9:50	11:20
	12:20	13:20	13:20	13:20	13:20
	13:20	16:50	16:20	16:20	16:20
	15:20	18:20	18:20	18:20	19:20
Tuesday	6:20	6:00	6:20	6:20	6:20

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	8:20	7:20	7:20	7:20	7:20
	9:20	8:20	8:20	8:20	8:20
	10:20	10:20	10:20	10:20	11:20
	11:20	13:20	13:20	13:20	13:20
	13:20	16:50	16:20	16:20	16:20
	15:20	18:20	18:20	18:20	19:20
Wednesday	5:10	6:00	6:20	6:20	6:20
	6:05	7:20	7:20	7:20	7:20
	7:00	8:20	8:20	8:20	8:20
	7:55	10:20	10:20	9:50	11:20
	8:50	13:20	13:20	13:20	13:20
	13:20	16:50	16:20	16:20	16:20
	15:20	18:20	18:20	18:20	19:20
Thursday	8:20	6:00	6:20	6:20	6:20
	14:20	7:20	7:20	7:20	7:20
	15:20	8:20	8:20	8:20	8:20
	16:20	10:20	10:20	10:20	11:20
	17:20	13:20	13:20	13:20	13:20
	18:20	16:50	16:20	16:20	16:20
	19:20	18:20	18:20	18:20	19:20
Friday	8:20	6:00	6:20	6:20	6:20
	9:20	7:20	7:20	7:20	7:20
	10:20	8:20	8:20	8:20	8:20
	11:20	10:20	10:20	10:50	11:20
	12:20	13:20	13:20	13:20	13:20
	13:20	16:50	16:20	16:20	16:20
	15:20	18:20	18:20	18:20	19:20
Saturday	9:20	5:50	5:50	5:50	5:50
	11:20	7:20	7:20	7:20	8:20
	12:20	8:20	8:20	8:20	9:20
	13:20	13:20	13:20	13:20	12:20
	14:20	16:50	16:20	16:20	16:20

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	18:20	18:20	18:20	18:20	18:20
Sunday	20:50	8:20	8:50	8:50	9:20
	21:45	16:50	16:20	16:20	17:45
	22:40	18:45	18:50	18:50	18:50

Table 119: Optimized KTEL schedule for Korinthos–Ag. Vasileios line

Korinthos-Agios Vasileios							
Departure	Day						Arrival
7:00	1	2	3	4	5	-	7:40
10:30	1	2	3	4	5	6	11:10
12:30	-	-	-	-	-	6	13:10
13:30	1	2	3	4	5	6	14:10
15:50	1	2	3	4	5	6	16:30
19:20	1	2	3	4	5	6	20:00
21:20	1	2	3	4	5	6	22:00
Agios Vasileios-Korinthos							
Departure	Day						Arrival
6:00	1	2	3	4	5	6	6:40
7:25	1	2	3	4	5	6	8:05
8:15	1	2	3	4	5	-	8:55
8:20	-	-	-	-	-	6	9:00
10:25	1	2	3	4	5	-	11:05
13:20	1	2	3	4	5	6	14:00
16:45	1	2	3	4	5	6	17:25
18:30	1	2	3	4	5	6	19:10

Table 120: Current KTEL schedule for Korinthos–Ag. Vasileios line

Departure time from Korinthos to Nemea					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:00	6:55	7:25	7:40	8:00
	11:30	10:15	10:00	10:00	10:40
	14:55	12:30	12:30	12:30	13:30
	17:30	15:55	15:55	15:55	16:30
	19:55	19:30	18:50	19:30	19:30
	22:30	21:30	21:30	22:00	22:00
Tuesday	9:00	6:55	7:25	7:40	8:00

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	11:55	10:30	10:00	10:00	10:50
	14:55	12:30	12:30	12:30	13:30
	18:30	15:55	15:55	15:55	15:55
	20:50	19:30	18:50	19:30	19:30
	23:20	21:30	21:50	22:00	22:00
Wednesday	9:00	6:55	7:25	7:40	8:00
	12:30	10:30	10:00	10:00	10:55
	14:55	12:30	12:30	12:30	13:30
	17:30	15:55	15:55	15:55	15:55
	19:55	19:30	18:50	19:30	19:30
	22:30	21:30	21:30	22:00	22:00
Thursday	9:00	6:55	7:25	7:40	8:00
	11:55	10:30	10:00	10:00	11:00
	15:55	12:30	12:30	12:30	13:30
	19:55	15:55	15:55	15:55	15:55
	22:00	19:30	18:50	19:30	19:30
	23:20	21:30	21:30	22:00	22:00
Friday	9:00	6:55	7:25	7:40	8:00
	11:55	10:30	10:00	10:00	11:00
	14:55	12:30	12:30	12:30	13:30
	18:00	15:55	15:55	15:55	15:55
	20:30	19:30	18:50	19:30	19:30
	23:20	21:30	21:30	22:00	22:00
Saturday	10:55	10:30	10:00	9:55	9:30
	14:00	12:30	12:00	11:55	11:30
	16:30	13:30	14:00	14:00	14:00
	18:30	15:55	15:55	16:30	16:30
	20:30	19:30	19:30	19:30	19:30
	22:30	21:30	21:30	22:00	22:00
Sunday	5:00	12:30	12:00	11:50	11:30
	7:30	15:55	15:55	16:30	16:30
	8:25	21:05	20:50	20:35	20:20
Departure time from Nemea to Korinthos					

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	8:05	7:05	7:05	7:05	6:05
	9:35	10:35	10:05	10:05	10:05
	11:05	11:35	11:05	11:05	11:05
	12:05	16:05	16:05	15:05	15:05
	13:05	19:05	19:05	19:05	19:05
	15:05	21:35	21:50	20:35	20:25
Tuesday	6:05	7:05	7:05	7:05	6:05
	8:05	10:35	10:05	10:05	10:05
	9:05	11:35	11:05	11:05	11:05
	11:05	16:05	16:05	15:05	15:05
	13:05	19:05	19:05	19:05	19:05
	15:05	21:35	21:50	20:35	20:25
Wednesday	8:05	7:05	7:05	7:05	6:05
	10:05	10:35	10:05	10:05	10:05
	11:05	11:35	11:05	11:05	11:05
	12:05	16:05	16:05	15:05	15:05
	13:05	19:05	19:05	19:05	19:05
	15:05	21:35	21:50	20:35	20:25
Thursday	6:05	7:05	7:05	7:05	6:05
	8:05	10:35	10:05	10:05	10:05
	11:05	11:35	11:05	11:05	11:05
	12:05	16:05	16:05	15:05	15:05
	13:05	19:05	19:05	19:05	19:05
	15:05	21:35	21:50	20:35	20:25
Friday	6:05	7:05	7:05	7:05	6:05
	8:05	10:35	10:05	10:05	10:05
	11:05	11:35	11:05	11:05	11:05
	12:05	16:05	16:05	15:05	15:05
	13:05	19:05	19:05	19:05	19:05
	15:05	21:35	21:50	20:35	20:25
Saturday	9:05	10:35	11:00	11:05	11:05

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	11:05	12:35	12:05	12:05	12:05
	12:05	16:05	16:05	16:05	14:55
	13:05	19:05	19:05	18:35	18:35
	18:05	21:35	21:50	20:35	20:25
Sunday	20:35	12:35	13:00	13:05	11:35
	21:30	21:05	20:50	20:35	20:35

Table 121: Optimized KTEL schedule for Korinthos–Nemea line

Korinthos-Nemea								
Departure	Day							Arrival
7:00	1	2	3	4	5	-	-	7:55
10:30	1	2	3	4	5	6	-	11:25
12:30	1	2	3	4	5	6	7	13:25
13:30	-	-	-	-	-	6	-	14:25
15:50	1	2	3	4	5	6	7	16:45
19:20	1	2	3	4	5	6	-	20:15
21:20	1	2	3	4	5	6	7	22:15
Nemea-Korinthos								
Departure	Day							Arrival
7:00	1	2	3	4	5	-	-	7:55
10:30	1	2	3	4	5	6	-	11:25
11:30	1	2	3	4	5	-	-	12:25
12:30	-	-	-	-	-	6	7	13:25
15:50	1	2	3	4	5	6	-	16:45
19:20	1	2	3	4	5	6	-	20:15
21:20	1	2	3	4	5	6	7	22:15

Table 122: Current KTEL schedule for Korinthos–Nemea line

Departure time from Korinthos to Athikia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:55	9:00	9:00	9:00	9:00
	12:30	10:40	11:00	11:00	11:00
	14:55	14:00	13:30	13:30	14:00
	18:30	15:55	15:55	15:55	15:55
	20:30	17:30	18:00	18:00	18:30
	23:20	20:30	20:30	20:50	20:50

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

Tuesday	10:00	8:55	8:30	8:30	8:00
	12:30	10:35	11:00	11:00	10:55
	15:30	14:00	13:30	13:30	13:30
	18:00	15:55	15:55	15:55	15:55
	19:55	17:30	18:00	18:00	18:30
	22:30	20:30	20:30	20:50	20:50
Wednesday	9:00	8:55	8:30	8:30	8:00
	11:55	10:35	11:00	11:00	11:00
	14:55	13:55	13:30	13:30	13:30
	18:00	15:55	15:55	15:55	15:55
	20:30	17:30	18:00	18:00	18:30
	23:20	20:30	20:30	20:50	20:50
Thursday	9:00	8:55	8:30	8:30	8:00
	11:55	10:35	11:00	11:00	10:50
	14:55	14:00	13:30	13:30	13:30
	18:00	15:55	15:55	15:55	15:55
	20:30	17:30	18:00	18:00	18:30
	23:20	20:30	20:30	20:50	20:50
Friday	10:00	8:55	8:30	8:30	8:00
	12:30	10:35	11:00	11:00	11:00
	15:55	14:00	13:30	13:30	13:30
	20:30	15:55	15:55	15:55	15:55
	22:00	17:30	18:00	18:00	18:30
	23:20	20:30	20:30	20:50	20:50
Saturday	14:00	11:45	11:30	11:30	11:00
	20:30	14:30	14:55	14:55	15:30
Sunday	5:00	12:25	12:10	11:55	11:40
Departure time from Athikia to Korinthos					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	8:30	6:30	6:30	6:30	6:30
	10:00	7:30	7:30	7:30	7:30
	11:30	9:30	9:00	10:00	8:30

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	12:30	11:00	11:30	11:30	11:30
	13:30	13:30	13:30	13:30	13:30
	15:30	16:30	16:30	16:30	15:30
Tuesday	6:30	6:30	6:30	6:30	6:30
	8:30	7:30	7:30	7:30	7:30
	9:30	9:30	9:00	9:00	8:30
	11:30	11:00	11:30	11:30	11:30
	13:30	13:30	13:30	13:30	13:30
	15:30	16:30	16:30	16:30	15:30
Wednesday	8:30	6:30	6:30	6:30	6:30
	10:30	7:30	7:30	7:30	7:30
	11:30	9:30	10:00	9:00	8:30
	12:30	11:00	11:30	11:30	11:30
	13:30	13:30	13:30	13:30	13:30
	15:30	16:30	16:30	16:30	15:30
Thursday	6:30	6:30	6:30	6:30	6:30
	8:30	7:30	7:30	7:30	7:30
	11:30	9:30	10:00	9:00	8:30
	12:30	11:00	11:30	11:30	11:30
	13:30	13:30	13:30	13:30	13:30
	15:30	16:30	16:30	16:30	15:30
Friday	6:30	6:30	6:30	6:30	6:30
	8:30	7:30	7:30	7:30	7:30
	11:30	9:30	9:00	9:00	8:30
	12:30	11:00	11:30	11:30	11:30
	13:30	13:30	13:30	13:30	13:30
	15:30	16:30	16:30	16:30	15:30
Saturday	11:30	8:30	8:30	8:30	9:30
Sunday	21:00	16:30	16:30	16:30	17:30

Table 123: Optimized KTEL schedule for Korinthos–Athikia line

Korinthos-Athikia								
Departure	Day							Arrival
9:00	1	2	3	4	5	-	-	9:30

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10:30	1	2	3	4	5	-	-	11:00
12:00	-	-	-	-	-	6	-	12:30
12:40	-	-	-	-	-	-	7	13:10
14:00	1	2	3	4	5	-	-	14:30
14:30	-	-	-	-	-	6	-	15:00
16:00	1	2	3	4	5	-	-	16:30
17:30	1	2	3	4	5	-	-	18:00
20:15	1	2	3	4	5	-	-	20:45
Athikia-Korinthos								
Departure	Day							Arrival
6:20	1	2	3	4	5	-	-	6:50
7:20	1	2	3	4	5	-	-	7:50
8:30	-	-	-	-	-	6	-	9:00
9:30	1	2	3	4	5	-	-	10:00
11:00	1	2	3	4	5	-	-	11:30
13:30	1	2	3	4	5	-	-	14:00
16:30	1	2	3	4	5	-	7	17:00

Table 124: Current KTEL schedule for Korinthos–Athikia line

Departure time from Korinthos to Isthmia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	11:55	9:55	10:00	10:00	10:00
	18:00	12:55	13:30	13:30	14:00
	22:30	16:30	16:50	17:10	17:30
Tuesday	11:54	9:30	9:10	8:55	8:55
	19:10	12:55	12:30	12:30	12:30
	22:30	16:30	16:50	17:10	17:30
Wednesday	11:00	9:30	9:10	8:55	8:40
	15:55	12:55	12:30	12:30	12:30
	22:30	16:30	16:50	17:10	17:30
Thursday	11:00	9:30	9:10	8:55	8:55
	15:55	12:55	12:30	12:30	12:30
	22:30	16:30	16:50	17:10	17:30
Friday	11:00	9:30	9:10	8:55	8:55

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	15:55	12:55	12:30	12:30	12:30
	22:30	16:30	16:50	17:10	17:30
Saturday	5:00	12:45	12:30	12:15	12:00
Departure time from Isthmia to Korinthos					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	8:40	10:10	9:40	10:10	9:10
	11:40	13:10	13:40	13:40	13:40
	13:40	16:40	16:40	16:40	15:40
Tuesday	8:40	10:10	10:10	10:10	9:10
	11:40	13:10	13:40	13:40	13:40
	13:40	16:40	16:40	16:40	15:40
Wednesday	8:40	10:10	9:40	10:10	9:10
	11:40	13:10	13:40	13:40	13:40
	13:40	16:40	16:40	16:40	15:40
Thursday	8:40	10:10	10:10	10:10	9:10
	11:40	13:10	13:40	13:40	13:40
	13:40	16:40	16:40	16:40	15:40
Friday	8:40	10:10	10:10	10:10	9:10
	13:40	13:10	13:40	13:40	13:40
	15:40	16:40	16:40	16:40	15:40
Saturday	11:40	10:10	9:40	9:40	9:40
	12:40	13:10	13:40	12:40	12:40

Table 125: Optimized KTEL schedule for Korinthos–Isthmia line

Korinthos-Isthmia								
Departure	Day							Arrival
9:40	1	2	3	4	5	-	-	10:00
13:00	1	2	3	4	5	6	-	13:20
16:30	1	2	3	4	5	-	-	16:50
Isthmia-Korinthos								
Departure	Day							Arrival
10:00	1	2	3	4	5	6	-	10:20
13:10	1	2	3	4	5	6	-	13:30
16:40	1	2	3	4	5	-	-	17:00

Table 126: Current KTEL schedule for Korinthos–Isthmia line

Departure time from Korinthos to Sofiko					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:00	9:00	9:00	9:00	10:00
	12:30	11:30	11:00	11:00	12:30
	15:55	14:00	14:00	14:00	14:55
	19:30	16:50	17:30	16:30	18:00
	22:30	19:55	20:30	20:30	20:50
Tuesday	9:00	8:55	8:30	8:30	9:00
	12:30	11:30	11:00	11:00	11:55
	16:30	14:00	14:00	14:00	14:55
	19:30	16:50	17:30	17:30	18:00
	22:30	19:55	20:30	20:30	20:50
Wednesday	10:00	8:55	8:30	8:30	8:00
	13:30	11:30	11:00	11:00	11:00
	16:50	14:00	14:00	14:00	14:00
	19:55	16:50	17:30	17:30	17:30
	22:30	19:55	20:30	20:30	20:50
Thursday	9:00	8:55	8:30	8:30	8:00
	11:55	11:30	11:00	11:00	11:00
	15:55	14:00	14:00	14:00	14:55
	20:30	16:50	17:30	17:30	18:00
	23:20	19:55	20:30	20:30	20:50
Friday	9:00	8:55	8:30	8:30	8:00
	12:30	11:30	11:00	11:00	11:00
	15:55	14:00	14:00	14:00	14:00
	19:55	16:50	16:30	17:30	17:30
	23:20	19:55	20:30	20:30	20:50
Saturday	17:30	14:00	14:30	14:30	14:55
Sunday	5:00	13:45	13:30	13:15	13:00
Departure time from Sofiko to Korinthos					
Day	Variation				

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	fully relaxed	±15min	±30min	±45min	±60min
Monday	8:10	7:10	7:10	7:10	8:10
	11:10	8:10	8:10	8:10	9:10
	12:10	10:10	9:40	9:40	10:10
	13:10	13:10	13:10	13:10	13:10
	15:10	17:10	16:40	16:40	16:10
Tuesday	6:10	7:10	7:10	7:10	8:10
	8:10	8:10	8:10	8:10	9:10
	11:10	10:10	9:40	9:40	10:10
	13:10	13:10	13:10	13:10	13:10
	15:10	17:10	16:40	16:40	16:10
Wednesday	8:10	7:10	7:10	7:10	8:10
	11:10	8:10	8:10	8:10	9:10
	12:10	10:10	9:40	9:40	10:10
	13:10	13:10	13:10	13:10	13:10
	15:10	17:10	16:40	16:40	16:10
Thursday	8:10	7:10	7:10	7:10	8:10
	11:10	8:10	8:10	8:10	9:10
	12:10	10:10	9:40	9:40	10:10
	13:10	13:10	13:10	13:10	13:10
	15:10	17:10	16:40	16:40	16:10
Friday	8:10	7:10	7:10	7:10	8:10
	9:40	8:10	8:10	8:10	9:10
	11:10	10:10	9:40	9:40	10:10
	13:10	13:10	13:10	13:10	13:10
	15:10	17:10	16:40	16:40	16:10
Saturday	11:10	17:10	17:30	17:40	18:00
Sunday	20:40	17:10	17:30	17:40	18:00

Table 127: Optimized KTEL schedule for Korinthos–Sofiko line

Korinthos-Sofiko								
Departure	Day							Arrival
9:00	1	2	3	4	5	-	-	9:50
11:30	1	2	3	4	5	-	-	12:10

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14:00	1	2	3	4	5	6	7	14:50
17:00	1	2	3	4	5	-	-	17:50
20:00	1	2	3	4	5	-	-	20:50
Sofiko-Korinthos								
Departure	Day							Arrival
7:20	1	2	3	4	5	-	-	8:10
8:20	1	2	3	4	5	-	-	9:10
10:00	1	2	3	4	5	-	-	10:50
13:00	1	2	3	4	5	-	-	13:50
17:00	1	2	3	4	5	6	7	17:50

Table 128: Current KTEL schedule for Korinthos–Sofiko line

Above, the resulted schedules for the fully relaxed, 30 minute window (± 15 min), 60 minute window (± 30 min), 90 minute window (± 45 min) and 120 minute window (± 60 min) case of Korinthos destinations were presented. Additionally, the current schedule for every route was presented. Below, the resulted total waiting time and average waiting time will be presented. They are calculated taking into consideration all the optimized routes of Evoia prefecture and more specifically of Chalkida KTEL station, which is used as intermediate node.

	Fully relaxed	± 15 min	± 30 min	± 45 min	± 60 min	Current
Total waiting time	467,280	908,185	852,650	814,130	772,685	1,008,915
Av. Waiting time	81	149	140	134	127	165
Feasible transitions	76,239	90,754	89,938	89,826	88,962	90,801

Table 129: Results table of Korinthos' destinations

	Fully relaxed	± 15 min	± 30 min	± 45 min	± 60 min	Current
Fully relaxed	0					
± 15min	-0.944	0				
± 30min	-0.825	0.061	0			
± 45min	-0.742	0.104	0.045	0		
± 60min	-0.654	0.149	0.094	0.051	0	
Current	-1.159	-0.111	-0.183	-0.239	-0.306	0

Table 130: Percentage difference of total waiting time between code variations for Korinthos destinations

In the above results of Korinthos destinations, a reduction up to 116% is observed. To be more precise, the percentage of decrease is 11.1% between current and 30 minute window case, 18.3% between current and 60 minute window case, 23.9% between current and 90 minute window case, 30.6% between current and 120 minute window case and 115.9% between current and fully relaxed case. The last one case is equal to a decrease of about 541,635 minutes from the current total waiting time and a reduction of 84 minutes in average waiting time respectively. Thus, the average waiting time in fully relaxed case do not exceed the 81 minutes whereas in current timetable is 165 minutes.

5.3.1.4 Livadeia Destinations Results

Intermediate node: Livadeia

Despite the fact that Livadeia belongs to the same prefecture as Thiva, it is mentioned separately because it is used as intermediate node for all these routes below and, at the same time, it is a train station exactly like Thiva. So all its KTEL connections have been collected as data.

Departure time from Livadeia to Agios Georgios					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	7:25	6:30	6:30	7:25	7:25
	9:30	10:25	10:00	9:45	9:30
	12:25	12:25	12:00	12:00	12:25
	15:25	13:45	14:25	14:25	15:00
Tuesday	5:00	6:30	6:15	6:00	5:45
	9:30	10:25	10:00	9:45	9:30
	12:25	12:25	12:00	12:00	12:25
	15:25	13:45	14:25	14:25	15:00
Wednesday	5:00	6:30	6:15	6:00	5:45
	9:30	10:25	10:00	9:45	9:30
	12:25	12:25	12:00	12:00	12:25
	15:25	13:45	14:25	14:25	15:00

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Thursday	5:00	6:30	6:15	6:00	5:45
	9:30	10:25	10:00	9:45	9:30
	12:25	12:25	12:00	12:00	12:25
	15:25	13:45	14:25	14:25	15:00
Friday	5:00	6:30	6:15	6:00	5:45
	7:25	10:25	10:00	9:45	9:30
	9:30	12:25	12:00	12:00	12:00
	11:30	13:45	13:30	13:15	13:00
Departure time from Agios Georgios to Livadeia					
	Variation				
Day	fully relaxed	±15min	±30min	±45min	±60min
Monday	6:25	7:10	7:25	6:25	6:25
	8:55	8:10	8:30	8:45	8:55
	11:40	11:55	11:40	11:40	11:40
	13:40	15:30	15:45	16:00	16:10
Tuesday	5:55	7:10	7:25	6:25	6:25
	8:55	8:10	8:30	8:45	8:55
	11:40	11:55	11:40	11:40	11:40
	13:40	15:30	15:45	16:00	16:10
Wednesday	5:55	7:10	7:25	6:25	6:25
	8:55	8:10	8:30	8:45	8:55
	11:40	11:55	11:40	11:40	11:40
	13:40	15:30	15:45	16:00	16:10
Thursday	6:25	7:10	7:25	6:25	6:25
	8:55	8:10	8:30	8:45	8:55
	11:40	11:55	11:40	11:40	11:39
	13:40	15:30	15:45	16:00	16:10
Friday	6:25	7:10	7:25	6:25	6:25
	8:55	8:10	8:30	8:45	8:55
	11:40	11:55	11:40	11:40	11:40

	13:40	15:30	15:45	16:00	16:10
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Table 131: Optimized KTEL schedule for Livadeia– Ag. Georgios line

Livadeia-Ag. Georgios								
Departure	Day							Arrival
6:45	1	2	3	4	5	-	-	7:05
10:30	1	2	3	4	5	-	-	10:50
12:30	1	2	3	4	5	-	-	12:50
14:00	1	2	3	4	5	-	-	14:20
Ag. Georgios-Livadeia								
Departure	Day							Arrival
7:00	1	2	3	4	5	-	-	7:20
8:00	1	2	3	4	5	-	-	8:20
12:00	1	2	3	4	5	-	-	12:20
15:15	1	2	3	4	5	-	-	15:35

Table 132: Current KTEL schedule for Livadeia– Ag. Georgios line

Departure time from Livadeia to Davleia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	6:45	6:45	6:45	6:45	6:45
	12:00	12:00	12:00	12:00	12:00
	14:00	14:00	14:00	14:00	14:00
Tuesday	6:45	6:45	6:45	6:45	6:45
	12:00	12:00	12:00	12:00	12:00
	14:00	14:00	14:00	14:00	14:00
Wednesday	6:45	6:45	6:45	6:45	6:45
	12:00	12:00	12:00	12:00	12:00
	14:00	14:00	14:00	14:00	14:00
Thursday	6:45	6:45	6:45	6:45	6:45
	12:00	12:00	12:00	12:00	12:00
	14:00	14:00	14:00	14:00	14:00
Friday	6:45	6:45	6:45	6:45	6:45
	12:00	12:00	12:00	12:00	12:00
	14:00	14:00	14:00	14:00	14:00
Saturday	6:45	6:45	6:45	6:45	6:45

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	14:00	14:00	14:00	14:00	14:00
Departure time from Davleia to Livadeia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	7:30	7:30	7:30	7:30	7:30
	13:10	13:10	13:10	13:10	13:10
	14:45	14:45	14:45	14:45	14:45
Tuesday	7:30	7:30	7:30	7:30	7:30
	13:10	13:10	13:10	13:10	13:10
	14:45	14:45	14:45	14:45	14:45
Wednesday	7:30	7:30	7:30	7:30	7:30
	13:10	13:10	13:10	13:10	13:10
	14:45	14:45	14:45	14:45	14:45
Thursday	7:30	7:30	7:30	7:30	7:30
	13:10	13:10	13:10	13:10	13:10
	14:45	14:45	14:45	14:45	14:45
Friday	7:30	7:30	7:30	7:30	7:30
	13:10	13:10	13:10	13:10	13:10
	14:45	14:45	14:45	14:45	14:45
Saturday	7:30	7:30	7:30	7:30	7:30
	14:45	14:45	14:45	14:45	14:45

Table 133: Optimized KTEL schedule for Livadeia–Davleia line

Livadeia-Davleia								
Departure	Day							Arrival
6:45	1	2	3	4	5	6	-	7:15
12:00	1	2	3	4	5	-	-	12:30
14:00	1	2	3	4	5	6	-	14:30
Davleia-Livadeia								
Departure	Day							Arrival
7:30	1	2	3	4	5	6	-	8:00
13:10	1	2	3	4	5	-	-	13:40
14:45	1	2	3	4	5	6	-	15:15

Table 134: Current KTEL schedule for Livadeia–Davleia line

Departure time from Livadeia to Agia Triada

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Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:30	6:30	6:30	7:25	7:25
	12:25	10:25	10:25	9:45	9:30
	15:25	13:45	14:25	14:25	15:00
Tuesday	5:00	6:30	6:15	6:00	5:45
	9:30	10:25	10:25	9:45	9:30
	15:25	13:45	14:25	14:25	14:59
Wednesday	5:00	6:30	6:15	6:00	5:45
	9:30	10:25	10:25	9:45	9:30
	15:25	13:45	14:25	14:25	15:00
Thursday	5:00	6:30	6:15	6:00	5:45
	9:30	10:25	10:25	9:45	9:30
	15:25	13:45	14:25	14:25	15:00
Friday	5:00	6:30	6:15	6:00	5:45
	7:25	10:25	10:00	9:45	9:30
	9:25	13:45	13:30	13:15	13:00
Departure time from Agia Triada to Livadeia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	8:40	7:55	8:15	8:30	8:40
	11:25	11:40	11:25	11:25	11:25
	13:25	15:25	15:40	15:55	15:55
Tuesday	8:40	7:55	8:15	8:30	8:40
	11:25	11:40	11:25	11:25	11:25
	13:25	15:25	15:40	15:55	15:55
Wednesday	8:40	7:55	8:15	8:30	8:40
	11:25	11:40	11:25	11:25	11:25
	13:25	15:25	15:40	15:55	15:55
Thursday	8:40	7:55	8:15	8:30	8:40
	11:25	11:40	11:25	11:25	11:25
	13:25	15:25	15:40	15:55	15:55
Friday	8:40	7:55	8:15	8:30	8:40

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	11:25	11:40	11:25	11:25	11:25
	13:25	15:25	15:40	15:55	15:55

Table 135: Optimized KTEL schedule for Livadeia–Ag. Triada line

Livadeia-Ag. Triada						
Departure	Day					Arrival
6:45	1	2	3	4	5-	7:20
10:30	1	2	3	4	5-	11:05
14:00	1	2	3	4	5-	14:35
Ag. Triada-Livadeia						
Departure	Day					Arrival
7:45	1	2	3	4	5-	8:20
11:45	1	2	3	4	5-	12:20
15:10	1	2	3	4	5-	15:45

Table 136: Current KTEL schedule for Livadeia–Ag. Triada line

Departure time from Livadeia to Agia Anna					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:30	6:30	6:30	7:25	7:25
	15:25	13:45	14:25	14:25	15:00
Tuesday	5:00	6:30	6:30	6:00	5:45
	15:25	13:45	14:25	14:25	15:00
Wednesday	5:00	6:30	6:30	6:00	5:45
	15:25	13:45	14:25	14:25	15:00
Thursday	5:00	6:30	6:30	6:00	5:45
	15:25	13:45	14:25	14:25	15:00
Friday	5:00	6:30	6:30	6:00	5:45
	7:00	13:45	13:30	13:15	13:00
Departure time from Agia Anna to Livadeia					
Day	Variation				

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	fully relaxed	±15min	±30min	±45min	±60min
Monday	11:15	7:45	8:00	8:15	8:30
	13:15	14:45	14:45	15:15	15:30
Tuesday	11:15	7:45	8:00	8:15	8:30
	13:15	14:45	14:45	15:15	15:30
Wednesday	11:15	7:45	8:00	8:15	8:30
	13:15	14:45	14:45	15:15	15:30
Thursday	11:15	7:45	8:00	8:15	8:30
	13:15	14:45	14:45	15:15	15:30
Friday	11:15	7:45	8:00	8:15	8:30
	13:15	14:45	14:45	15:15	15:30

Table 137: Optimized KTEL schedule for Livadeia–Ag. Anna line

Livadeia-Ag. Anna							
Departure	Day						Arrival
6:45	1	2	3	4	5	-	7:30
14:00	1	2	3	4	5	-	14:45
Ag. Anna-Livadeia							
Departure	Day						Arrival
7:30	1	2	3	4	5	-	8:15
14:30	1	2	3	4	5	-	15:45

Table 138: Current KTEL schedule for Livadeia–Ag. Anna line

Departure time from Livadeia to Kiriaki					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:30	6:30	6:30	6:30	6:30
	15:25	13:45	13:45	14:25	14:25
Tuesday	5:00	6:00	5:45	5:30	5:15
	15:25	13:45	13:45	14:25	14:25
Wednesday	5:00	6:00	5:45	5:30	5:15
	15:25	13:45	13:45	14:25	14:25
Thursday	5:00	6:00	5:45	5:30	5:15

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	15:25	13:45	13:45	14:25	14:25
Friday	5:00	6:00	5:45	5:30	5:15
	7:00	13:30	13:15	13:00	12:45
Departure time from Kiriaki to Livadeia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	11:15	7:00	7:40	7:45	8:10
	13:15	15:05	15:20	15:35	15:45
Tuesday	11:15	7:00	7:40	7:45	8:10
	13:15	15:05	15:20	15:35	15:45
Wednesday	11:15	7:00	7:40	7:45	8:10
	13:15	15:05	15:20	15:35	15:45
Thursday	11:15	7:00	7:40	7:45	8:10
	13:15	15:05	15:20	15:35	15:45
Friday	11:15	7:00	7:40	7:45	8:10
	13:15	15:05	15:20	15:35	15:45

Table 139: Optimized KTEL schedule for Livadeia–Kiriaki line

Livadeia-Kiriaki							
Departure	Day						Arrival
6:15	1	2	3	4	5	-	7:00
13:45	1	2	3	4	5	-	14:30
Kiriaki-Livadeia							
Departure	Day						Arrival
7:10	1	2	3	4	5	-	7:55
14:50	1	2	3	4	5	-	15:35

Table 140: Current KTEL schedule for Livadeia–Kiriaki line

Departure time from Livadeia to Koronia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:30	6:30	6:30	6:30	6:30

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	15:25	12:25	13:00	13:00	13:25
Tuesday	5:00	6:00	5:45	5:30	5:15
	15:25	12:25	13:00	13:00	13:25
Wednesday	5:00	6:00	5:45	5:30	5:15
	15:25	12:25	13:00	13:00	13:25
Thursday	5:00	6:00	5:45	5:30	5:15
	15:25	12:25	13:00	13:00	13:25
Friday	5:00	6:00	5:45	5:30	5:15
	7:00	12:15	12:00	11:45	11:30
Departure time from Koronia to Livadeia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	11:30	7:00	7:15	6:15	6:15
	13:30	13:15	13:30	13:30	13:30
Tuesday	11:30	7:00	7:15	6:15	6:15
	13:30	13:15	13:30	13:30	13:30
Wednesday	11:30	7:00	7:15	6:15	6:15
	13:30	13:15	13:30	13:30	13:30
Thursday	11:30	7:00	7:15	6:15	6:15
	13:30	13:15	13:30	13:30	13:30
Friday	11:30	7:00	7:15	6:15	6:15
	13:30	13:15	13:30	13:30	13:30

Table 141: Optimized KTEL schedule for Livadeia–Koronia line

Livadeia-Koronia								
Departure	Day							Arrival
6:15	1	2	3	4	5	-	-	6:45
12:30	1	2	3	4	5	-	-	13:00
Koronia-Livadeia								
Departure	Day							Arrival
6:55	1	2	3	4	5	-	-	7:25
13:00	1	2	3	4	5	-	-	13:30

Table 142: Current KTEL schedule for Livadeia–Koronia line

Departure time from Livadeia to Akontio
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Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	15:25	8:25	8:25	9:00	9:00
Tuesday	15:25	8:25	8:25	9:00	9:00
Wednesday	15:25	8:25	8:25	9:00	9:00
Thursday	13:45	8:25	8:25	9:00	9:00
Friday	5:00	8:00	7:45	7:30	7:15
Departure time from Akontio to Livadeia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	11:35	12:45	13:00	11:50	11:35
Tuesday	11:35	12:45	13:00	11:50	11:35
Wednesday	11:35	12:45	13:00	11:50	11:35
Thursday	11:35	12:45	13:00	11:50	11:35
Friday	11:35	12:45	13:00	11:50	11:35

Table 143: Optimized KTEL schedule for Livadeia–Akontio line

Livadeia-Akontio								
Departure	Day							Arrival
8:15	1	2	3	4	5	-	-	8:40
Akontio-Livadeia								
Departure	Day							Arrival
12:30	1	2	3	4	5	-	-	12:55

Table 144: Current KTEL schedule for Livadeia–Akontio line

Departure time from Livadeia to Ag. Dimitrios					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	15:25	8:00	8:25	8:25	9:00
Tuesday	15:25	8:00	8:25	8:25	9:00
Wednesday	15:25	8:00	8:25	8:25	9:00
Thursday	13:45	8:00	8:25	8:25	9:00
Friday	5:00	7:45	7:30	7:15	7:00
Departure time from Agios Dimitrios to Livadeia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min

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Monday	11:25	12:45	12:55	13:15	13:25
Tuesday	11:25	12:45	12:55	13:15	13:25
Wednesday	11:25	12:45	12:55	13:15	13:25
Thursday	11:25	12:45	12:55	13:15	13:25
Friday	11:25	12:45	12:55	13:15	13:25

Table 145: Optimized KTEL schedule for Livadeia–Ag. Dimitrios line

Livadeia-Ag. Dimitrios									
Departure	Day								Arrival
8:00	1	2	3	4	5	-	-		8:35
Ag. Dimitrios-Livadeia									
Departure	Day								Arrival
12:30	1	2	3	4	5	-	-		13:05

Table 146: Current KTEL schedule for Livadeia–Ag. Dimitrios line

Departure time from Livadeia to Kastro						
Day	Variation					
	fully relaxed	±15min	±30min	±45min	±60min	
Monday	9:30	6:30	6:30	6:30	7:25	
	15:25	13:45	14:25	14:25	15:00	
Tuesday	5:00	6:30	6:00	5:45	5:30	
	15:25	13:45	14:25	14:25	15:00	
Wednesday	5:00	6:30	6:00	5:45	5:30	
	15:25	13:45	14:25	14:25	15:00	
Thursday	5:00	6:30	6:00	5:45	5:30	
	15:25	13:45	14:25	14:25	15:00	
Friday	5:00	6:30	6:00	5:45	5:30	
	7:00	13:45	13:30	13:15	13:00	
Departure time from Kastro to Livadeia						
Day	Variation					
	fully relaxed	±15min	±30min	±45min	±60min	
Monday	11:15	7:00	7:40	7:45	8:10	
	13:15	14:45	15:10	15:25	15:40	
Tuesday	11:15	7:00	7:40	7:45	8:10	
	13:15	14:45	15:10	15:25	15:40	

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Wednesday	11:15	7:00	7:40	7:45	8:10
	13:15	14:45	15:10	15:25	15:40
Thursday	11:15	7:00	7:40	7:45	8:10
	13:15	14:45	15:10	15:25	15:40
Friday	11:15	7:00	7:40	7:45	8:10
	13:15	14:45	15:10	15:25	15:40

Table 147: Optimized KTEL schedule for Livadeia–Kastro line

Livadeia-Kastro								
Departure	Day							Arrival
6:30	1	2	3	4	5	-	-	7:15
14:00	1	2	3	4	5	-	-	14:45
Kastro-Livadeia								
Departure	Day							Arrival
7:10	1	2	3	4	5	-	-	7:55
14:40	1	2	3	4	5	-	-	15:25

Table 148: Current KTEL schedule for Livadeia–Kastro line

Above, the resulted schedules for the fully relaxed, 30 minute window (± 15 min), 60 minute window (± 30 min), 90 minute window (± 45 min) and 120 minute window (± 60 min) case of Livadeia destinations were presented. Additionally, the current schedule for every route was presented. Below, the resulted total waiting time and average waiting time will be presented. They are calculated taking into consideration all the optimized routes of Fokida prefecture that are connected with Livadeia and some routes of Voiotia prefecture. More specifically, in this section are included all the optimized routes of Livadeia KTEL station, which is used as intermediate node.

	Fully relaxed	± 15min	± 30min	± 45min	± 60min	Current
Total waiting time	495,590	736,095	713,295	695,540	670,800	760,430
Av. Waiting time	299	422	411	403	389	435
Feasible transitions	9,139	10,817	10,698	10,669	10,602	10,842

Table 149: Results table of Livadeia destinations

	Fully relaxed	± 15min	± 30min	± 45min	± 60min	Current
Fully relaxed	0					
± 15min	-0.485	0				
± 30min	-0.439	0.031	0			
± 45min	-0.403	0.055	0.025	0		
± 60min	-0.354	0.088	0.06	0.036	0	
Current	-0.534	-0.033	-0.066	-0.093	-0.134	0

Table 150: Percentage difference of total waiting time between code variations for Livadeia destinations

In the above results of Livadeia destinations, a reduction up to 53.4% is observed. To be more precise, the percentage of decrease is 3.3% between current and 30 minute window case, 6.6% between current and 60 minute window case, 9.3% between current and 90 minute window case, 13.4% between current and 120 minute window case and 53.4% between current and fully relaxed case. The last one is equal to a decrease of about 264,840 minutes from the current total waiting time and a reduction of 136 minutes in average waiting time respectively. What is worth to mention is that the percentage difference is about 40% greater than the percentage difference between current and 120 minute window case. Thus, by neglecting the current departure times, the waiting time is significantly reduced.

5.3.1.5 Lamia Destinations Results

Intermediate node: Lamia

Departure time from Lamia to Karpnisi					
Days	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	10:25	10:30	10:25	10:25	10:25
	15:25	13:20	13:20	13:20	14:25
	20:40	19:45	19:40	20:40	20:40
Tuesday	10:25	10:30	10:25	10:25	10:25
	15:25	13:20	13:20	13:20	14:25
	20:40	19:45	19:40	20:40	20:40
Wednesday	10:25	10:30	10:25	10:25	10:25
	15:25	13:20	13:20	13:20	14:25

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	20:40	19:45	19:40	20:40	20:40
Thursday	10:25	10:30	10:25	10:25	10:25
	15:25	13:20	13:20	13:20	14:25
	20:40	19:45	19:40	20:40	20:40
Friday	10:25	10:30	10:25	10:25	10:25
	15:25	13:20	13:20	13:20	14:25
	20:40	19:45	19:40	20:40	20:40
Saturday	10:25	10:30	10:25	10:25	10:25
	15:25	13:20	13:20	13:20	14:25
	20:40	19:45	19:40	20:40	20:40
Sunday	8:00	10:30	10:15	10:10	10:10
	10:30	19:45	19:30	19:15	19:00
Departure time from Karpenisi to Lamia					
	Variation				
Day	fully relaxed	±15min	±30min	±45min	±60min
Monday	7:30	6:30	7:00	7:15	7:30
	10:30	9:15	9:30	9:30	9:30
	13:30	16:45	17:00	17:00	15:30
Tuesday	7:30	6:30	7:00	7:15	7:30
	10:30	9:15	9:30	9:30	9:30
	13:30	16:45	17:00	17:00	15:30
Wednesday	7:30	6:30	7:00	7:15	7:30
	10:30	9:15	9:30	9:30	9:30
	13:30	16:45	17:00	17:00	15:30
Thursday	7:30	6:30	7:00	7:15	7:30
	10:30	9:15	9:30	9:30	9:30
	13:30	16:45	17:00	17:00	15:30
Friday	7:30	6:30	7:00	7:15	7:30
	10:30	9:15	9:30	9:30	9:30
	13:30	16:45	17:00	17:00	15:30
Saturday	7:30	6:30	7:00	7:15	7:30
	10:30	9:15	9:30	9:30	9:30
	13:30	16:45	17:00	17:00	15:30

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Sunday	9:30	9:15	9:30	9:30	9:30
	13:30	16:45	17:00	17:00	15:30

Table 151: Optimized KTEL schedule for Lamia–Karpenisi line

Lamia-Karpenisi									
Departure	Day							Arrival	
10:45	1	2	3	4	5	6	7	12:15	
13:30	1	2	3	4	5	6		15:00	
20:00	1	2	3	4	5	6	7	21:30	
Karpenisi-Lamia									
Departure	Day							Arrival	
6:30	1	2	3	4	5	6		8:00	
9:00	1	2	3	4	5	6	7	10:30	
16:30	1	2	3	4	5	6	7	18:00	

Table 152: Current KTEL schedule for Lamia–Karpenisi line

Departure time from Lamia to Volos					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	15:25	8:55	8:55	8:55	8:55
	20:40	17:30	17:25	18:25	18:25
Tuesday	18:25	8:55	8:55	8:55	8:00
Wednesday	10:25	8:55	8:55	8:55	8:00
	20:40	17:30	17:25	18:25	18:25
Thursday	13:20	8:55	8:55	8:55	8:55
	20:40	17:30	17:25	18:25	18:25
Friday	13:20	8:55	8:55	8:55	8:55
	20:40	14:45	15:25	15:25	15:25
Saturday	17:25	8:45	8:30	8:15	8:00
Sunday	8:00	8:45	8:30	8:15	8:00
	10:30	14:45	14:30	14:15	14:00
Departure time from Volos to Lamia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	7:00	15:00	15:00	15:00	15:00
Tuesday	7:00	15:00	15:00	15:00	15:00

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Wednesday	7:00	15:00	15:00	15:00	15:00
Thursday	7:00	15:00	15:00	15:00	15:00
Friday	7:00	15:00	15:00	15:00	15:00
	13:00	18:00	18:00	18:00	18:00
Saturday	9:00	15:00	15:00	15:00	15:00
Sunday	9:00	15:00	15:00	15:00	15:00
	13:00	18:00	18:00	18:00	18:00

Table 153: Optimized KTEL schedule for Lamia–Volos line

Lamia-Volos								
Departure	Day							Arrival
9:00	1	2	3	4	5	6	7	11:00
15:00	-	-	-	-	5	-	7	17:00
17:45	1	-	3	4	-	-	-	19:45
Volos-Lamia								
Departure	Day							Arrival
15:00	1	2	3	4	5	6	7	17:00
18:00	-	-	-	-	5	-	7	19:00

Table 154: Current KTEL schedule for Lamia–Volos line

Departure time from Lamia to Fournia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	8:40	5:30	5:15	5:00	4:45
Departure time from Fournia to Lamia					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	6:00	13:00	13:00	12:00	12:00

Table 155: Optimized KTEL schedule for Lamia–Fournia line

Lamia-Fournia								
Departure	Day							Arrival
12:45	1	-	-	-	-	-	-	15:45
Fournia-Lamia								
Departure	Day							Arrival
5:45	1	-	-	-	-	-	-	8:45

Table 156: Current KTEL schedule for Lamia–Fournia line

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Above, the resulted schedules for the fully relaxed, 30 minute window (± 15 min), 60 minute window (± 30 min), 90 minute window (± 45 min) and 120 minute window (± 60 min) case of Lamia destinations were presented. Additionally, the current schedule for every route was presented. Below, the resulted total waiting time and average waiting time will be presented. They are calculated taking into consideration all the optimized routes of Fthiotida prefecture as well as the routes of Evritania prefecture that are connected with Lamia. More specifically, in this section are included all the optimized routes of Lamia KTEL station, which is used as intermediate node.

	Fully relaxed	± 15 min	± 30 min	± 45 min	± 60 min	Current
Total waiting time	63,330	99,775	96,265	90,500	88,385	103,440
Av. Waiting time	210	320	310	292	285	332
Feasible transitions	1,938	2,142	2,123	2,125	2,126	2,142

Table 157: Results table of Lamia’s destinations

	Fully relaxed	± 15 min	± 30 min	± 45 min	± 60 min	Current
Fully relaxed	0					
± 15min	-0.575	0				
± 30min	-0.520	0.035	0			
± 45min	-0.429	0.093	0.060	0		
± 60min	-0.396	0.114	0.082	0.023	0	
Current	-0.633	-0.037	-0.075	-0.143	-0.170	0

Table 158: Percentage difference of total waiting time between code variations for Lamia

In the above results of Lamia destinations, a reduction up to 63.3% is observed. To be more precise, the percentage of decrease is 3.7% between current and 30 minute window case, 7.5% between current and 60 minute window case, 14.3% between current and 90 minute window case, 17% between current and 120 minute window case and 63.3% between current and fully relaxed case. The last one is equal to a decrease of about 40,110 minutes from the current total waiting time and a reduction of 122 minutes in average waiting time respectively. What is mentioned in Livadeia occasion is applied in the aforementioned waiting time results, too.

5.3.2 Section B: Bus- To- Train Synchronization

In this part, the bus routes are synchronized with the existing train schedule, as explained above. This synchronization takes place between the capital cities of the prefectures that have bus connection and the closest city that has train station as well. For the remaining prefectures, these cities with train stations are Athens and Patra. Therefore, below are presented these two sections. In each section, cities of the same prefecture where existed route to the city with train station group together. For instance, the results table of waiting time for Mesologgi and Agrinio, that are presented below, are calculated taking into consideration the changes in time of both of them and thus are presented together. The resulted schedules are created exactly for the same cases as the aforementioned ones referred to at the beginning of Section A.

5.3.2.1 Patra Destinations

Intermediate node: Patra

Departure time from Patra to Mesologgi					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:00	5:45	5:30	5:15	5:00
	9:15	7:00	6:45	8:00	6:15
	11:15	7:45	8:00	8:15	6:30
	12:25	9:15	9:15	10:15	10:15
	14:15	11:35	11:20	12:25	12:25
	16:15	14:15	14:15	14:15	14:15
	17:15	15:25	15:25	16:15	16:15
	19:15	17:15	17:15	17:15	17:15
	21:15	19:15	19:15	19:15	19:15
	22:15	21:15	21:15	21:15	21:15
Tuesday	5:00	5:45	5:30	5:15	5:00

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	9:15	7:00	6:45	8:00	6:15
	11:15	7:45	8:00	8:15	6:30
	12:25	9:15	9:15	10:15	10:15
	14:15	11:35	11:20	12:25	12:25
	16:15	14:15	14:15	14:15	14:15
	17:15	15:25	15:25	16:15	16:15
	19:15	17:15	17:15	17:15	17:15
	21:15	19:15	19:15	19:15	19:15
	22:15	21:15	21:15	21:15	21:15
Wednesday	5:00	5:45	5:30	5:15	5:00
	10:15	7:00	6:45	8:00	6:15
	11:15	7:45	8:00	8:15	6:30
	12:25	9:15	9:15	10:15	10:15
	14:15	11:35	11:20	12:25	12:25
	16:15	14:15	14:15	14:15	14:15
	17:15	15:25	15:25	16:15	16:15
	19:15	17:15	17:15	17:15	17:15
	21:15	19:15	19:15	19:15	19:15
	22:15	21:15	21:15	21:15	21:15
Thursday	5:00	5:45	5:30	5:15	5:00
	10:15	7:00	6:45	8:00	6:15
	11:15	7:45	8:00	8:15	6:30
	12:25	9:15	9:15	10:15	10:15
	14:15	11:35	11:20	12:25	12:25
	16:15	14:15	14:15	14:15	14:15
	17:15	15:25	15:25	16:15	16:15
	19:15	17:15	17:15	17:15	17:15
	21:15	19:15	19:15	19:15	19:15
	22:15	21:15	21:15	21:15	21:15
Friday	5:00	5:45	5:30	5:15	5:00
	10:15	7:00	6:45	8:00	6:15
	11:15	7:45	8:00	8:15	6:30

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	12:25	9:15	9:15	10:15	10:15
	14:15	11:35	11:20	12:25	12:25
	16:15	14:15	14:15	14:15	14:15
	17:15	15:25	15:25	16:15	16:15
	19:15	17:15	17:15	17:15	17:15
	21:15	19:15	19:15	19:15	19:15
	22:15	21:15	21:15	21:15	21:15
Saturday	5:00	7:15	7:00	6:45	6:30
	10:15	9:15	9:15	10:15	10:15
	12:25	11:45	11:30	12:25	12:25
	15:25	13:45	14:15	14:15	14:15
	17:15	14:45	15:25	15:25	15:25
	19:15	17:15	17:15	17:15	17:15
	21:15	19:15	19:15	19:15	19:15
	22:15	21:15	21:15	21:15	21:15
Sunday	10:15	9:15	9:15	9:15	9:15
	12:25	11:45	12:25	11:15	11:15
	15:25	14:45	15:25	14:15	14:15
	17:15	17:15	17:15	16:15	16:15
	19:15	19:15	19:15	18:25	18:25
	21:15	20:45	20:30	20:15	20:00
Departure time from Mesologgi to Patra					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:20	4:35	4:35	4:35	4:35
	6:35	6:00	5:20	5:20	5:20
	7:35	8:50	8:50	8:50	8:50
	8:50	11:15	10:35	10:35	10:35
	10:35	13:15	12:35	12:35	12:35
	11:35	14:35	14:35	14:35	14:35
	14:35	16:20	16:20	16:20	15:35
	23:20	19:45	20:00	20:15	20:30
Tuesday	4:35	4:35	4:35	4:35	4:35

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	6:35	6:00	5:20	5:20	5:20
	7:35	8:50	8:50	8:50	8:50
	8:50	11:15	10:35	10:35	10:35
	10:35	13:15	12:35	12:35	12:35
	11:35	14:35	14:35	14:35	14:35
	14:35	16:20	16:20	16:20	15:35
	23:20	19:45	20:00	20:15	20:30
Wednesday	4:35	4:35	4:35	4:35	5:20
	6:35	6:00	5:20	5:20	6:35
	8:50	8:50	8:50	8:50	8:50
	10:35	11:15	10:35	10:35	10:35
	11:35	13:15	12:35	12:35	12:35
	12:35	14:35	14:35	14:35	14:35
	14:35	16:20	16:20	16:20	15:35
	23:20	19:45	20:00	20:15	20:30
Thursday	7:35	4:35	4:35	4:35	4:35
	10:35	6:00	5:20	5:20	6:35
	11:35	8:50	8:50	8:50	8:50
	12:35	11:15	10:35	10:35	10:35
	14:35	13:15	12:35	12:35	12:35
	15:35	14:35	14:35	14:35	14:35
	17:35	16:20	16:20	16:20	15:35
	23:20	19:45	20:00	20:15	20:30
Friday	4:35	4:35	4:35	4:35	4:35
	6:35	6:00	5:20	5:20	6:35
	7:35	8:50	8:50	8:50	8:50
	8:50	11:15	10:35	10:35	10:35
	10:35	13:15	13:20	13:20	12:35
	11:35	14:35	14:35	14:35	14:35
	14:35	16:20	16:20	16:20	15:35
	23:20	19:45	20:00	20:15	20:30
Saturday	5:20	7:30	7:35	6:35	6:35

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	6:35	9:55	10:10	10:25	8:50
	7:35	12:35	12:35	12:34	11:35
	8:50	14:35	14:35	14:35	14:35
	14:35	16:20	16:20	16:20	15:35
	23:20	19:45	20:00	20:15	20:30
Sunday	8:50	9:45	10:00	8:50	8:50
	11:35	12:35	12:35	12:35	12:35
	14:30	14:35	14:35	14:35	14:35
	17:35	16:20	16:20	16:20	15:35
	23:20	19:15	19:00	18:45	18:30

Table 159: Optimized KTEL schedule for Patra–Mesologgi line

Patra-Mesologgi								
Departure	Day						Arrival	
6:00	1	2	3	4	5		6:40	
7:15	1	2	3	4	5		7:55	
7:30	1	2	3	4	5	6	8:10	
9:00						7	9:40	
9:30	1	2	3	4	5	6	10:10	
11:50	1	2	3	4	5		12:30	
12:00						6	7	12:40
14:00	1	2	3	4	5	6	14:40	
15:00						6	7	15:40
15:30	1	2	3	4	5		16:10	
17:00	1	2	3	4	5	6	7	17:40
19:00	1	2	3	4	5	6	7	19:40
21:00	1	2	3	4	5	6	7	21:40
Mesologgi-Patra								
Departure	Day						Arrival	
4:50	1	2	3	4	5		5:30	
5:45	1	2	3	4	5		6:25	
7:15						6	7:55	
9:00	1	2	3	4	5		9:40	
9:30						7	10:10	
9:40						6	10:20	
11:00	1	2	3	4	5		11:40	

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12:30						6	7	13:10
13:00	1	2	3	4	5			13:40
14:30	1	2	3	4	5	6	7	15:10
16:30	1	2	3	4	5	6	7	17:10
19:30	1	2	3	4	5	6	7	20:10

Table 160: Current KTEL schedule for Patra–Mesologgi line

Departure time from Patra to Agrinio					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:00	5:45	5:30	5:15	5:00
	10:15	7:00	6:45	8:00	8:15
	12:25	9:15	9:15	10:15	10:15
	14:15	11:45	11:30	12:25	12:25
	16:15	14:15	14:15	14:15	14:15
	17:15	15:25	15:25	16:15	16:15
	19:15	17:15	17:15	17:15	17:15
	21:15	19:15	19:15	19:15	19:15
Tuesday	5:00	5:45	5:30	5:15	5:00
	10:15	7:00	6:45	8:00	8:15
	12:25	9:15	9:15	10:15	10:15
	15:25	11:45	12:25	12:25	12:25
	17:15	15:25	15:25	15:25	15:25
	19:15	17:15	17:15	17:15	17:15
	21:15	19:15	19:15	19:15	19:15
	22:15	21:15	21:15	21:15	21:15
Wednesday	5:00	5:45	5:30	5:15	5:00
	10:15	7:00	6:45	8:00	8:15
	12:25	9:15	9:15	10:15	10:15
	15:25	11:45	12:25	12:25	12:25
	17:15	15:25	15:25	15:25	15:25
	19:15	17:15	17:15	17:15	17:15

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	21:15	19:15	19:15	19:15	19:15
	22:15	21:15	21:15	21:15	21:15
Thursday	5:00	5:45	5:30	5:15	5:00
	10:15	7:00	6:45	8:00	8:15
	12:25	9:15	9:15	10:15	10:15
	15:25	11:45	12:25	12:25	12:25
	17:15	15:25	15:25	15:25	15:25
	19:15	17:15	17:15	17:15	17:15
	21:15	19:15	19:15	19:15	19:15
	22:15	21:15	21:15	21:15	21:15
Friday	5:00	5:45	5:30	5:15	5:00
	10:15	7:00	6:45	8:00	8:15
	12:25	9:15	9:15	10:15	10:15
	14:15	11:45	11:30	12:25	12:25
	16:15	14:15	14:15	14:15	14:15
	17:15	15:25	15:25	16:15	16:15
	19:15	17:15	17:15	17:15	17:15
	21:15	19:15	19:15	19:15	19:15
	22:15	21:15	21:15	21:15	21:15
Saturday	5:00	7:15	7:00	6:45	6:30
	10:15	9:15	9:15	10:15	10:15
	12:25	11:45	11:30	12:25	12:25
	15:25	13:45	14:15	14:15	14:15
	17:15	14:45	15:25	15:25	15:25
	19:15	17:15	17:15	17:15	17:15
	21:15	19:15	19:15	19:15	19:15
	22:15	21:15	21:15	21:15	21:15
Sunday	10:15	9:15	9:15	9:15	9:15
	12:25	11:45	12:25	11:15	11:15
	15:25	14:45	15:25	14:15	14:15
	19:15	17:14	17:15	15:15	16:15
	21:15	19:15	19:15	18:25	18:25
	22:15	20:45	20:30	20:15	20:00

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Departure time from Agrinio to Patra					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	3:45	3:45	4:30	3:45	3:45
	5:45	5:30	5:45	4:30	4:30
	6:45	6:45	6:45	6:45	8:00
	8:00	9:25	9:40	9:45	9:45
	9:45	10:45	10:45	10:45	10:45
	10:45	12:30	12:30	11:45	11:45
	11:45	13:45	13:45	14:45	13:45
	13:45	16:15	15:30	16:45	16:45
	22:30	19:15	19:30	19:45	20:00
Tuesday	3:45	3:45	4:30	3:45	3:45
	5:45	5:30	5:45	4:30	4:30
	6:45	9:25	9:40	9:45	9:45
	8:00	10:45	10:45	10:45	10:45
	9:45	12:30	12:30	11:45	11:45
	10:45	13:45	13:45	14:45	13:45
	13:45	16:15	15:30	16:45	16:45
		22:30	19:15	19:30	19:45
Wednesday	4:30	3:45	4:30	3:45	3:45
	5:45	5:30	5:45	4:30	4:30
	8:00	9:25	9:40	9:45	9:45
	9:45	10:45	10:45	10:45	10:45
	10:45	12:30	12:30	11:45	11:45
	11:45	13:45	13:45	14:45	13:45
	13:45	16:15	15:30	16:45	16:45
		22:30	19:15	19:30	19:45
Thursday	3:45	3:45	4:30	3:45	3:45
	6:45	5:30	5:45	4:30	5:45
	8:00	9:25	9:40	9:45	9:45
	9:45	10:45	10:45	10:45	10:45

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	10:45	12:30	12:30	11:45	11:45
	11:45	13:45	13:45	14:45	13:45
	13:45	16:15	15:30	16:45	15:30
	22:30	19:15	19:30	19:45	20:00
Friday	4:30	3:45	4:30	3:45	3:45
	5:45	5:30	5:45	4:30	5:45
	6:45	6:45	6:45	6:45	8:00
	8:00	9:25	9:40	9:45	9:45
	9:45	10:45	10:45	10:45	10:45
	10:45	12:30	12:30	11:45	11:45
	12:30	13:45	13:45	14:45	13:45
	13:45	16:15	15:30	16:45	15:30
	22:30	19:15	19:30	19:45	20:00
Saturday	3:45	6:45	6:45	6:45	6:45
	5:45	9:25	9:40	9:45	9:45
	6:45	11:45	12:30	12:30	12:30
	8:00	13:45	13:45	14:45	13:45
	13:45	16:15	15:30	16:45	15:30
	22:30	19:15	19:30	19:45	20:00
Sunday	9:45	9:25	9:40	9:45	9:45
	10:45	11:45	12:30	12:30	12:30
	12:30	13:45	13:45	14:45	13:45
	13:45	16:15	15:30	16:45	16:45
	22:30	18:45	18:30	18:15	18:00

Table 161: Optimized KTEL schedule for Patra–Agrinio line

Patra-Agrinio								
Departure	Day					Arrival		
6:00	1	2	3	4	5	7:30		
7:15	1	2	3	4	5	8:45		
7:30					6	9:00		
9:00					7	10:30		
9:30	1	2	3	4	5	6	11:00	
12:00	1	2	3	4	5	6	7	13:30
14:00	1				5	6	15:30	

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15:00						6	7	16:30
15:30	1	2	3	4	5			17:00
17:00	1	2	3	4	5	6	7	18:30
19:00	1	2	3	4	5	6	7	20:30
21:00	1	2	3	4	5	6	7	22:30
Agrinio-Patra								
Departure	Day						Arrival	
4:00	1	2	3	4	5			5:30
5:15	1	2	3	4	5			6:45
6:45						6		8:15
7:00	1				5			8:30
9:10	1	2	3	4	5	6	7	10:40
10:30	1	2	3	4	5			12:00
12:00						6	7	13:30
12:30	1	2	3	4	5			14:00
14:00	1	2	3	4	5	6	7	15:30
16:00	1	2	3	4	5	6	7	17:30
19:00	1	2	3	4	5	6	7	20:30

Table 162: Current KTEL schedule for Patra–Agrinio line

Above, the resulted schedules for the fully relaxed, 30 minute window (± 15 min), 60 minute window (± 30 min), 90 minute window (± 45 min) and 120 minute window (± 60 min) case of Aitoloakarnania routes that are connected with Patra were presented. Additionally, the current schedule for every route was presented. What is more, as it was mentioned above, waiting time results tables for Agrinio and Mesologgi are presented together as results in waiting time between Patra and Aitoloakarnania prefecture routes.

	Fully relaxed	± 15min	± 30min	± 45min	± 60min	Current
Total waiting time	6,820	19,060	16,955	15,670	15,300	32,460
Av. Waiting time	26	68	61	56	55	116
Feasible transitions	4,042	4,918	4,909	4,927	4,901	4,867

Table 163: Results table between Patra and Aitoloakarnania routes

	Fully relaxed	± 15min	± 30min	± 45min	± 60min	Current
Fully relaxed	0					
± 15min	-1.795	0				
± 30min	-1.486	0.110	0			
± 45min	-1.298	0.178	0.076	0		
± 60min	-1.243	0.197	0.098	0.024	0	
Current	-3.760	-0.703	-0.914	-1.071	-1.122	0

Table 164: Percentage difference of total waiting time between code variations from Patra to Aitoloakarnania destinations

In the above results of Aitoloakarnania routes connecting Patra, a reduction up to 376% is observed. To be more precise, the percentage of decrease is 70.3% between current and 30 minute window case, 91.4% between current and 60 minute window case, 107.1% between current and 90 minute window case, 112.2% between current and 120 minute window case and 376% between current and fully relaxed case. The last one is equal to a decrease of about 25,640 minutes from the current total waiting time and a reduction of 90 minutes in average waiting time respectively. It is a great reduction, especially when seeing the values of results table where current total waiting time is 32,460 and fully relaxed case only 6,820. What is more the average waiting time in fully relaxed case are 26 minutes when in current schedule reaches 116 minutes.

Departure time from Patra to Pyrgos					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	9:15	5:15	5:00	4:45	4:30
	11:15	7:00	7:15	7:30	5:45
	12:30	9:15	9:15	9:15	9:15
	14:15	11:15	11:15	11:15	11:15
	15:30	12:30	12:30	12:30	12:30
	17:15	13:45	14:15	14:15	14:15
	18:30	15:00	15:30	15:30	15:30
	19:45	17:15	17:15	17:15	17:15
	21:15	18:30	18:30	19:15	19:15
	22:30	20:45	20:45	21:15	21:15
Tuesday	9:15	5:15	5:00	4:45	4:30
	11:15	7:00	7:15	7:30	5:45

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	12:30	9:15	9:15	9:15	9:15
	14:15	11:15	11:15	11:15	11:15
	15:30	12:30	12:30	12:30	12:30
	17:15	13:45	14:15	14:15	14:15
	18:30	15:00	15:30	15:30	15:30
	19:45	17:15	17:15	17:15	17:15
	21:15	18:30	18:30	19:15	19:15
	22:30	20:45	20:45	21:15	21:15
Wednesday	9:15	5:15	5:00	4:45	4:30
	11:15	7:00	7:15	7:30	5:45
	12:30	9:15	9:15	9:15	9:15
	14:15	11:15	11:15	11:15	11:15
	15:30	12:30	12:30	12:30	12:30
	17:15	13:45	14:15	14:15	14:15
	18:30	15:00	15:30	15:30	15:30
	19:45	17:15	17:15	17:15	17:15
	21:15	18:30	18:30	19:15	19:15
	22:30	20:45	20:45	21:15	21:15
Thursday	9:15	5:15	5:00	4:45	4:30
	11:15	7:00	7:15	7:30	5:45
	12:30	9:15	9:15	9:15	9:15
	14:15	11:15	11:15	11:15	11:15
	15:30	12:30	12:30	12:30	12:30
	17:15	13:45	14:15	14:15	14:15
	18:30	15:00	15:30	15:30	15:30
	19:45	17:15	17:15	17:15	17:15
	21:15	18:30	18:30	19:15	19:15
	22:20	20:45	20:45	21:15	21:15
Friday	9:15	5:15	5:00	4:45	4:30
	11:15	7:00	7:15	7:30	5:45
	12:30	9:15	9:15	9:15	9:15
	14:15	11:15	11:15	11:15	11:15

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	15:30	12:30	12:30	12:30	12:30
	17:15	13:45	14:15	14:15	14:15
	18:30	15:00	15:30	15:30	15:30
	19:45	17:15	17:15	17:15	17:15
	21:15	18:30	18:30	19:15	19:15
	22:30	20:45	20:45	21:15	21:15
Saturday	9:15	6:30	6:15	6:00	5:45
	11:15	9:15	9:15	9:15	9:15
	12:30	11:15	11:15	11:15	11:15
	14:15	12:30	12:30	12:30	12:30
	16:15	13:45	14:15	14:15	14:15
	17:30	15:00	15:30	15:30	15:30
	19:15	17:15	17:15	17:15	17:15
	21:15	18:30	18:30	19:15	19:15
	22:30	20:45	20:45	21:15	21:15
Sunday	5:00	6:30	6:15	6:00	5:45
	6:15	9:15	9:15	9:15	9:15
	8:00	11:15	11:15	11:15	11:15
	9:15	13:30	14:15	13:00	12:45
	11:15	14:45	15:30	14:15	14:15
	12:30	17:15	17:15	16:15	16:15
	14:15	18:30	18:30	18:25	18:25
	15:30	20:25	20:10	19:55	19:40
Departure time from Pyrgos to Patra					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	4:00	5:45	5:45	4:45	4:45
	5:45	7:15	7:00	7:00	7:00
	7:00	8:30	8:15	8:15	8:15
	8:15	9:45	10:00	10:00	10:00
	9:45	11:00	11:45	12:00	12:00
	11:00	13:45	14:00	14:00	14:00
	12:45	15:00	15:30	15:45	15:45

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	14:00	17:00	17:00	17:00	17:00
	15:45	18:15	18:30	18:45	19:00
	17:00	20:15	20:30	20:45	21:00
Tuesday	4:00	5:45	5:45	4:45	4:45
	5:45	7:15	7:00	7:00	7:00
	7:00	8:30	8:15	8:15	8:15
	8:15	9:45	10:00	10:00	10:00
	9:45	11:00	11:45	12:00	12:00
	11:00	13:45	14:00	14:00	14:00
	12:45	15:00	15:30	15:45	15:45
	14:00	17:00	17:00	17:00	17:00
	15:45	18:15	18:30	18:45	19:00
	17:00	20:15	20:30	20:45	21:00
Wednesday	4:00	5:45	5:45	4:45	4:45
	5:45	7:15	7:00	7:00	7:00
	7:00	8:30	8:15	8:15	8:15
	8:15	9:45	10:00	10:00	10:00
	9:45	11:00	11:45	12:00	12:00
	11:00	13:45	14:00	14:00	14:00
	12:45	15:00	15:30	15:45	15:45
	14:00	17:00	17:00	17:00	17:00
	15:45	18:15	18:30	18:45	19:00
	17:00	20:15	20:30	20:45	21:00
Thursday	4:00	5:45	5:45	4:45	4:45
	5:45	7:15	7:00	7:00	7:00
	7:00	8:30	8:15	8:15	8:15
	8:15	9:45	10:00	10:00	10:00
	9:45	11:00	11:45	12:00	12:00
	11:00	13:45	14:00	14:00	14:00
	12:45	15:00	15:30	15:45	15:45
	14:00	17:00	17:00	17:00	17:00
	15:45	18:15	18:30	18:45	19:00

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	17:00	20:15	20:30	20:45	21:00
Friday	4:00	5:45	5:45	4:45	4:45
	5:45	7:15	7:00	7:00	7:00
	7:00	8:30	8:15	8:15	8:15
	8:15	9:45	10:00	10:00	10:00
	9:45	11:00	11:45	12:00	12:00
	11:00	13:45	14:00	14:00	14:00
	12:45	15:00	15:30	15:45	15:45
	14:00	17:00	17:00	17:00	17:00
	15:45	18:15	18:30	18:45	19:00
17:00	20:15	20:30	20:45	21:00	
Saturday	4:00	7:15	7:00	7:00	7:00
	5:45	8:30	8:15	8:15	8:15
	7:00	9:45	10:00	10:00	10:00
	8:15	11:00	11:45	12:00	12:00
	10:00	13:45	14:00	14:00	14:00
	12:00	15:00	15:30	15:45	15:45
	14:00	17:00	17:00	17:00	17:00
	15:45	18:15	18:30	18:45	19:00
	17:00	20:15	20:30	20:45	21:00
Sunday	4:00	7:45	7:00	7:00	7:00
	7:00	9:45	10:00	10:00	10:00
	8:15	11:00	11:45	12:00	12:00
	10:00	13:45	14:00	14:00	14:00
	12:45	15:00	15:30	15:45	15:45
	14:00	17:00	17:15	17:30	17:45
	15:45	18:15	18:30	18:45	19:00
	17:00	19:45	20:30	20:45	21:00

Table 165: Optimized KTEL schedule for Patra–Pyrgos line

Patra-Pyrgos								
Departure	Day						Arrival	
5:30	1	2	3	4	5		6:45	
6:45	1	2	3	4	5	6	7	8:00
9:30	1	2	3	4	5	6	7	10:45

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11:00	1	2	3	4	5	6	7	12:15
12:30	1	2	3	4	5	6		13:45
13:45	1	2	3	4	5	6	7	15:00
15:00	1	2	3	4	5	6	7	16:15
17:00	1	2	3	4	5	6	7	17:15
18:40	1	2	3	4	5	6	7	19:55
20:40	1	2	3	4	5	6	7	21:55
Pyrgos-Patra								
Departure	Day						Arrival	
5:30	1	2	3	4	5			6:45
7:30	1	2	3	4	5	6	7	8:45
8:15	1	2	3	4	5	6		9:30
9:45	1	2	3	4	5	6	7	11:00
11:15	1	2	3	4	5	6	7	12:30
13:30	1	2	3	4	5	6	7	14:45
15:00	1	2	3	4	5	6	7	16:15
17:15	1	2	3	4	5	6	7	18:30
18:00	1	2	3	4	5	6	7	19:15
20:00	1	2	3	4	5	6	7	21:15

Table 166: Current KTEL schedule for Patra–Pyrgos line

Above, the resulted schedules for the fully relaxed, 30 minute window (± 15 min), 60 minute window (± 30 min), 90 minute window (± 45 min) and 120 minute window (± 60 min) case of Hleia prefecture line connected with Patra were presented. Additionally, the current schedule for that line was presented. The prefecture of Hleia is connected with Patra only with line Pyrgos-Patra, where Pyrgos is the capital city of the prefecture.

	Fully relaxed	± 15min	± 30min	± 45min	± 60min	Current
Total waiting time	1,510	15,865	13,570	9,945	9,645	24,345
Av. Waiting time	10	104	89	65	63	160
Feasible transitions	2,411	2,909	2,897	2,901	2,886	2,897

Table 167: Results table of Patra- Pyrgos route

	Fully relaxed	± 15min	± 30min	± 45min	± 60min	Current
Fully relaxed	0					
± 15min	-9.507	0				
± 30min	-7.987	0.145	0			
± 45min	-5.586	0.373	0.267	0		
± 60min	-5.387	0.392	0.289	0.030	0	
Current	-15.123	-0.535	-0.794	-1.448	-1.524	0

Table 168: Percentage difference of total waiting time between code variations for Patra-Pyrgos route

In the above results of Hleia line connecting Patra, a reduction up to 1512.3% is observed. More precisely, the percentage of decrease is 53.5% between current and 30 minute window case, 79.4% between current and 60 minute window case, 144.8% between current and 90 minute window case, 152.4% between current and 120 minute window case and 1512.3% between current and fully relaxed case. The last one is equal to a decrease of about 22,835 minutes from the current total waiting time and a reduction of 150 minutes in average waiting time respectively. It is an enormous reduction, especially when seeing the values of results table where current total waiting time is 24,345 and fully relaxed case only 1,510. What is more the average waiting time in fully relaxed case is only 10 minutes when in current schedule reaches 160 minutes.

5.3.2.2 Athens Destinations

Intermediate node: Athens

Departure time from Athens to Tripoli					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	5:35	5:20	5:16	5:16
	6:30	7:45	7:30	7:15	7:00
	7:45	9:43	9:43	9:43	9:43
	9:43	10:45	10:38	10:38	10:38
	10:58	12:39	12:39	12:39	12:39
	12:39	13:45	13:30	13:15	13:08
	13:54	14:45	14:30	14:30	14:00

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	15:39	15:45	15:39	15:39	15:39
	16:54	16:45	16:30	16:15	16:08
	20:39	18:15	18:00	17:45	17:30
	22:27	20:00	20:39	20:39	20:39
	23:42	21:45	22:27	22:27	22:27
Tuesday	5:16	5:35	5:20	5:16	5:16
	6:30	7:45	7:30	7:15	7:00
	7:45	9:15	9:00	8:45	8:30
	9:00	10:45	10:38	10:38	10:38
	10:38	12:39	12:39	12:39	12:39
	12:39	13:45	13:30	13:15	13:08
	13:54	14:45	14:30	14:15	14:00
	15:39	15:45	15:39	15:39	15:39
	16:54	16:45	16:30	16:15	16:08
	20:39	18:15	18:00	17:45	17:30
	22:27	20:00	20:39	20:39	20:39
23:42	21:45	22:27	22:27	22:27	
Wednesday	5:16	5:35	5:20	5:16	5:16
	6:30	7:45	7:30	7:15	7:00
	7:45	9:15	9:00	8:45	8:30
	9:00	10:45	10:38	10:38	10:37
	10:38	12:39	12:39	12:39	12:39
	12:39	13:45	13:30	13:15	13:09
	13:54	14:45	14:30	14:15	14:00
	15:39	15:45	15:39	15:39	15:38
	16:54	16:45	16:30	16:15	16:08
	20:39	18:15	18:00	17:45	17:30
	22:27	20:00	20:39	20:39	20:39
23:42	21:45	22:27	22:27	22:27	
Thursday	5:16	5:35	5:20	5:16	5:16
	6:30	7:45	7:30	7:15	7:00
	7:45	9:15	9:00	8:45	8:30

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	9:00	10:45	10:38	10:38	10:38
	10:38	12:39	12:39	12:39	12:39
	12:39	13:45	13:30	13:15	13:08
	13:54	14:45	14:30	14:15	14:00
	15:39	15:45	15:39	15:39	15:39
	16:54	16:45	16:30	16:15	16:08
	20:39	18:15	18:00	17:45	17:30
	22:27	20:00	20:39	20:39	20:39
	23:42	21:45	22:27	22:27	22:27
	5:16	5:35	5:20	5:16	5:16
	6:30	7:45	7:30	7:15	7:00
	7:45	9:15	9:00	8:45	8:30
	9:00	10:45	10:38	10:38	10:38
	10:38	12:39	12:39	12:39	12:39
	12:39	13:45	13:30	13:15	13:08
	13:54	14:45	14:30	14:14	13:59
	15:39	15:45	15:39	15:39	15:39
	16:54	16:45	16:30	16:15	16:08
	18:09	17:15	17:00	16:45	16:38
	19:37	18:15	17:30	17:15	17:08
	20:51	18:45	18:30	19:37	19:37
	22:27	20:00	20:39	20:39	20:39
	23:42	21:45	22:27	22:27	22:27
Friday					
	5:16	7:15	7:00	6:45	6:30
	10:38	9:15	9:00	8:45	8:30
	12:39	10:45	10:38	10:38	10:38
	13:54	12:39	12:39	12:39	12:39
	15:39	13:45	13:30	13:15	13:09
	16:54	14:45	14:30	14:15	14:00
	18:21	15:45	15:39	15:39	15:39
	19:37	16:45	16:30	16:15	16:08
	20:39	18:15	18:00	17:45	17:30
Saturday					

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	22:27	20:00	20:39	20:39	20:39
	23:42	21:45	22:27	22:27	22:27
Sunday	5:16	7:15	7:00	6:45	6:30
	6:30	9:15	9:00	8:45	8:30
	7:45	10:45	10:38	10:38	10:37
	9:00	12:39	12:39	12:39	12:39
	10:38	13:45	13:30	13:15	13:09
	12:39	14:45	14:30	14:15	14:00
	13:54	15:45	15:39	15:39	15:39
	15:39	16:45	16:30	16:15	16:08
	17:06	17:45	17:30	17:15	17:09
	18:21	18:45	18:30	19:37	19:37
	19:37	20:00	19:45	20:39	20:39
	20:51	21:45	21:29	21:14	21:08
	22:27	22:45	22:29	22:27	22:27
Departure time from Tripoli to Athens					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	3:27	4:48	4:48	4:48	4:48
	4:42	7:00	7:15	7:17	5:57
	5:57	8:45	9:00	7:48	7:48
	7:48	9:45	10:00	10:15	10:30
	10:32	11:15	11:18	11:18	11:18
	11:48	12:30	11:48	11:48	11:48
	13:18	13:46	13:46	13:46	13:46
	14:33	15:15	15:30	15:18	15:18
	15:48	16:45	17:00	15:48	15:48
	19:15	17:45	18:00	18:15	18:30
	20:30	19:15	19:30	19:45	20:00
21:45	21:25	21:25	21:25	21:25	
Tuesday	3:27	4:48	4:48	4:48	4:48
	4:42	7:00	7:15	7:17	5:57
	5:57	8:45	9:00	7:48	7:48

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	7:48	9:45	10:00	10:15	10:30
	10:32	11:15	11:18	11:18	11:18
	11:48	12:30	11:48	11:48	11:48
	13:18	13:46	13:46	13:46	13:46
	14:33	15:15	15:30	15:18	15:18
	15:48	16:45	17:00	15:48	15:48
	19:15	17:45	18:00	18:15	18:30
	20:30	19:15	19:30	19:45	20:00
	21:45	21:25	21:25	21:25	21:25
	3:27	4:48	4:48	4:48	4:48
	4:42	7:00	7:15	7:17	5:57
	5:57	8:45	9:00	7:48	7:48
	7:48	9:45	10:00	10:15	10:30
	10:32	11:15	11:18	11:18	11:18
	11:48	12:30	11:48	11:48	11:48
Wednesday	13:18	13:46	13:46	13:46	13:46
	14:33	15:15	15:30	15:18	15:18
	15:48	16:45	17:00	15:48	15:48
	19:15	17:45	18:00	18:15	18:30
	20:30	19:15	19:30	19:45	20:00
	21:45	21:25	21:25	21:25	21:25
	3:27	4:48	4:48	4:48	4:48
	4:42	7:00	7:15	7:18	5:57
	5:57	8:45	9:00	7:48	7:48
	7:48	9:45	10:00	10:15	10:30
	10:32	11:15	11:18	11:18	11:18
	11:48	12:30	11:48	11:48	11:48
Thursday	13:18	13:46	13:46	13:46	13:46
	14:33	15:15	15:30	15:18	15:18
	15:48	16:45	17:00	15:48	15:48
	19:15	17:45	18:00	18:15	18:30
	20:30	19:15	19:30	19:45	20:00

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	21:45	21:25	21:25	21:25	21:25
Friday	3:27	4:48	4:48	4:48	4:48
	4:42	7:00	7:15	7:18	5:57
	5:57	8:45	8:48	7:48	7:48
	7:33	9:45	10:00	8:48	8:48
	8:48	11:15	11:18	11:18	11:18
	10:32	12:30	11:48	11:48	11:48
	11:48	13:46	13:46	13:46	13:46
	13:46	15:15	15:30	15:18	15:18
	15:32	16:17	16:17	15:48	15:48
	16:47	16:47	16:47	16:17	16:17
	19:15	17:45	18:00	16:47	16:47
	20:30	19:15	19:30	19:45	20:00
21:45	21:25	21:25	21:25	21:25	
Saturday	3:27	7:00	7:15	7:18	5:57
	4:42	8:45	9:00	7:48	7:48
	5:57	9:45	10:00	10:15	10:30
	7:48	11:15	11:18	11:18	11:18
	10:32	12:30	11:48	11:48	11:48
	11:48	13:46	13:46	13:46	13:46
	13:18	15:15	15:30	15:18	15:18
	14:32	16:45	17:00	15:48	15:48
	15:48	17:45	18:00	18:15	18:30
	20:30	19:15	19:30	19:45	20:00
	21:45	21:25	21:25	21:25	21:25
	Sunday	3:27	7:00	7:15	7:18
4:42		8:45	8:48	7:48	7:48
5:57		9:45	10:00	8:48	8:48
7:32		11:15	11:18	11:18	11:18
8:48		12:30	11:48	11:48	11:48
10:32		13:46	13:46	13:46	13:46
11:48		15:15	15:30	15:18	15:18

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	13:18	16:45	17:00	15:48	15:48
	14:32	17:15	17:30	17:45	18:00
	15:48	17:45	18:00	18:15	18:30
	19:15	19:15	19:30	19:45	20:00
	20:30	20:15	20:30	20:45	21:00
	21:45	21:45	22:00	22:15	22:30

Table 169: Optimized KTEL schedule for Athens–Tripoli line

Athens-Tripoli								
Departure	Day							Arrival
5:50	1	2	3	4	5			8:05
7:30						6	7	9:45
8:00	1	2	3	4	5			10:15
9:30	1	2	3	4	5	6	7	11:45
11:00	1	2	3	4	5	6	7	13:15
12:30	1	2	3	4	5	6	7	14:45
14:00	1	2	3	4	5	6	7	16:15
15:00	1	2	3	4	5	6	7	17:15
16:00	1	2	3	4	5	6	7	18:15
17:00	1	2	3	4	5	6	7	19:15
17:30					5			19:45
18:00					5		7	20:15
18:30	1	2	3	4		6		20:45
19:00					5		7	21:15
20:15	1	2	3	4	5	6	7	22:30
22:00	1	2	3	4	5	6	7	0:15
23:00							7	1:15

Tripoli-Athens								
Departure	Day							Arrival
5:00	1	2	3	4	5			7:15
6:45	1	2	3	4	5	6	7	9:00
8:30	1	2	3	4	5	6	7	10:45
9:30	1	2	3	4	5	6	7	11:45
11:00	1	2	3	4	5	6	7	13:15
12:15	1	2	3	4	5	6	7	14:45

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13:45	1	2	3	4	5	6	7	16:00
15:00	1	2	3	4	5	6	7	17:15
16:30	1	2	3	4	5	6	7	18:45
17:00					5		7	19:15
17:30	1	2	3	4	5	6	7	19:45
19:00	1	2	3	4	5	6	7	21:15
20:00							7	22:15
21:30	1	2	3	4	5	6	7	23:45

Table 170: Current KTEL schedule for Athens–Tripoli line

Departure time from Athens to Megalopoli					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	5:35	5:20	5:15	5:15
	9:43	7:45	7:30	7:15	7:00
	10:58	9:43	9:43	9:43	9:43
	12:39	10:45	10:38	10:38	10:38
	15:39	12:39	12:39	12:39	12:39
	20:39	14:45	14:30	15:39	15:39
	22:27	16:45	16:30	16:15	16:09
	23:42	20:00	20:39	20:39	20:39
Tuesday	5:16	5:35	5:20	5:16	5:16
	6:31	7:45	7:30	7:15	7:00
	10:38	9:15	9:00	8:45	8:30
	12:39	10:45	10:38	10:38	10:38
	15:39	12:39	12:39	12:39	12:39
	20:39	14:45	14:30	15:39	15:39
	22:27	16:45	16:30	16:15	16:08
	23:42	20:00	20:39	20:39	20:39
Wednesday	5:16	5:35	5:20	5:15	5:15
	6:31	7:45	7:30	7:15	7:00
	10:38	9:15	9:00	8:45	8:30

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	12:39	10:45	10:38	10:38	10:38
	15:39	12:39	12:39	12:39	12:39
	20:39	14:45	14:30	15:39	15:39
	22:27	16:45	16:30	16:15	16:08
	23:42	20:00	20:39	20:39	20:39
Thursday	5:16	5:35	5:20	5:15	5:15
	6:31	7:45	7:30	7:15	7:00
	10:38	9:15	9:00	8:45	8:30
	12:39	10:45	10:38	10:38	10:38
	15:39	12:39	12:39	12:39	12:39
	20:39	14:45	14:30	15:39	15:39
	22:27	16:45	16:30	16:15	16:09
	23:42	20:00	20:39	20:39	20:39
Friday	5:16	5:35	5:20	5:16	5:16
	10:38	7:45	7:30	7:15	7:00
	12:39	9:15	9:00	8:45	8:30
	15:39	10:45	10:38	10:38	10:38
	19:37	12:39	12:39	12:39	12:39
	20:52	14:45	14:30	15:39	15:39
	22:27	16:45	16:30	16:15	16:08
	23:42	20:00	20:39	20:39	20:39
Saturday	5:16	7:15	7:00	6:45	6:30
	10:38	9:15	9:00	8:45	10:30
	12:39	12:39	12:39	12:39	12:39
	15:39	14:45	14:30	15:39	15:39
	20:39	16:45	16:30	16:15	16:08
	23:39	20:00	20:39	20:39	20:39
Sunday	5:16	7:15	7:00	6:45	6:30
	10:38	9:15	9:00	8:45	10:30
	12:39	12:39	12:39	12:39	12:39
	15:39	14:45	14:30	15:39	15:39
	19:37	16:45	16:30	16:15	16:09
	22:27	20:00	19:44	19:37	19:37

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Departure time from Megalopoli to Athens					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	3:42	6:00	6:15	6:17	4:57
	4:57	7:30	6:48	6:48	6:48
	6:48	8:45	9:00	9:15	9:30
	9:33	10:15	10:30	10:45	10:47
	10:48	12:46	12:46	12:46	12:46
	12:46	14:15	14:30	14:45	14:48
	14:48	16:45	17:00	17:15	17:30
	19:30	18:15	18:30	18:45	19:00
	20:45	20:25	20:25	20:25	20:25
Tuesday	3:42	6:00	6:15	6:17	4:57
	4:57	7:30	6:48	6:47	6:47
	6:48	8:45	9:00	9:15	9:30
	9:33	10:15	10:30	10:45	10:47
	10:48	12:46	12:46	12:46	12:46
	12:46	14:15	14:30	14:45	14:48
	14:48	16:45	17:00	17:15	17:30
	19:30	18:15	18:30	18:45	19:00
	20:45	20:25	20:25	20:25	20:25
Wednesday	3:42	6:00	6:15	6:17	4:57
	4:57	7:30	6:48	6:47	6:47
	6:48	8:45	9:00	9:15	9:30
	9:33	10:15	10:30	10:45	10:48
	10:48	12:46	12:46	12:46	12:46
	12:46	14:15	14:30	14:45	14:48
	14:48	16:45	17:00	17:15	17:30
	19:30	18:15	18:30	18:45	19:00
	20:45	20:25	20:25	20:25	20:25
Thursday	3:42	6:00	6:15	6:18	4:57
	4:57	7:30	6:48	6:48	6:48

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	6:48	8:45	9:00	9:15	9:30
	9:33	10:15	10:30	10:45	10:48
	10:48	12:46	12:46	12:46	12:46
	12:46	14:15	14:30	14:45	14:48
	14:48	16:45	17:00	17:15	17:30
	19:30	18:15	18:30	18:45	19:00
	20:45	20:25	20:25	20:25	20:25
Friday	3:42	6:00	6:15	6:18	4:57
	4:57	7:30	6:48	6:48	6:48
	6:33	8:45	9:00	7:48	7:48
	7:47	10:15	10:30	10:45	10:48
	10:48	12:46	12:46	12:46	12:46
	12:46	14:15	14:30	14:45	14:48
	14:32	16:45	17:00	15:47	15:47
	15:47	18:15	18:30	18:45	19:00
	20:45	20:25	20:25	20:25	20:25
Saturday	3:42	6:00	6:15	6:18	4:57
	4:57	7:30	6:48	6:48	6:48
	6:48	8:45	9:00	9:15	9:30
	9:33	10:15	10:30	10:45	10:47
	10:48	12:46	12:46	12:46	12:46
	12:46	14:15	14:30	14:45	14:48
	14:48	16:45	17:00	17:15	17:30
	19:30	18:15	18:30	18:45	19:00
	20:45	20:25	20:25	20:25	20:25
Sunday	2:27	6:00	6:15	6:18	4:57
	3:42	7:30	6:48	6:48	6:48
	4:57	8:45	9:00	7:48	7:48
	6:32	10:15	10:30	10:45	10:47
	7:47	12:46	12:46	12:46	12:46
	9:33	14:15	14:30	14:18	14:18
	10:48	15:45	16:00	14:48	14:48
	12:46	16:45	17:00	17:15	17:30

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	14:48	17:15	17:30	17:45	18:00
	19:30	19:45	20:00	20:15	20:25
	20:45	20:45	21:00	21:15	21:30

Table 171: Optimized KTEL schedule for Athens–Megalopoli line

Athens-Megalopoli								
Departure	Day							Arrival
5:50	1	2	3	4	5			9:05
7:30						6	7	10:45
8:00	1	2	3	4	5			11:15
9:30	1	2	3	4	5	6	7	12:45
11:00	1	2	3	4	5			14:15
12:30	1	2	3	4	5	6	7	15:45
15:00	1	2	3	4	5	6	7	18:15
17:00	1	2	3	4	5	6	7	20:15
20:15	1	2	3	4	5	6	7	23:30

Megalopoli-Athens								
Departure	Day							Arrival
5:45	1	2	3	4	5	6	7	9:00
7:15	1	2	3	4	5	6	7	10:30
8:30	1	2	3	4	5	6	7	11:45
10:00	1	2	3	4	5	6	7	13:15
12:50	1	2	3	4	5	6	7	16:05
14:00	1	2	3	4	5	6	7	17:15
15:30							7	18:45
16:30	1	2	3	4	5	6		19:45
17:00							7	20:15
18:00	1	2	3	4	5	6		21:15
19:30							7	22:45
20:30	1	2	3	4	5	6		23:45

Table 172: Current KTEL schedule for Athens–Megalopoli line

Departure time from Athens to Leonidio					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min

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Monday	12:39	8:00	7:45	7:30	7:15
	23:39	15:45	15:39	15:39	15:39
Tuesday	12:39	8:00	7:45	7:30	7:15
	23:39	15:45	15:39	15:39	15:39
Wednesday	12:39	8:00	7:45	7:30	7:15
	23:39	15:45	15:39	15:39	15:39
Thursday	12:39	8:00	7:45	7:30	7:15
	23:39	15:45	15:39	15:39	15:39
Friday	5:16	8:00	7:45	7:30	7:15
	15:39	15:45	15:39	15:39	15:39
	23:39	18:15	18:00	17:45	17:30
Saturday	12:39	8:00	7:45	7:30	7:15
	23:39	15:45	15:39	15:39	15:39
Sunday	12:39	8:00	7:45	7:30	7:15
	23:39	15:45	15:39	15:39	15:39
Departure time from Leonidio to Athens					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	4:12	5:45	6:00	6:03	6:03
	6:03	8:30	8:45	9:00	9:15
	10:03	16:45	17:00	17:15	17:30
Tuesday	4:12	5:45	6:00	6:03	6:03
	6:03	8:30	8:45	9:00	9:15
	10:03	16:45	17:00	17:15	17:30
Wednesday	3:03	5:45	6:00	6:03	6:03
	6:03	8:30	8:45	9:00	9:15
	10:03	16:45	17:00	17:15	17:30
Thursday	3:03	5:45	6:00	6:03	6:03
	6:03	8:30	8:45	9:00	9:15
	10:03	16:45	17:00	17:15	17:30
Friday	3:03	5:45	6:00	6:03	6:03
	6:03	8:30	8:45	9:00	9:15
	10:03	16:45	17:00	17:15	17:30

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Saturday	3:03	5:45	6:00	6:03	6:03
	6:03	8:30	8:45	9:00	9:15
	7:02	16:45	17:00	17:15	17:30
Sunday	4:12	8:30	8:45	9:00	9:15
	6:03	16:45	17:00	17:15	17:30

Table 173: Optimized KTEL schedule for Athens–Leonidio line

Athens-Leonidio								
Departure	Day							Arrival
8:15	1	2	3	4	5	6	7	12:15
16:00	1	2	3	4	5	6	7	20:00
18:30					5			22:30
Leonidio-Athens								
Departure	Day							Arrival
5:30	1	2	3	4	5	6		9:30
8:15	1	2	3	4	5	6	7	12:15
16:30	1	2	3	4	5	6	7	20:30

Table 174: Current KTEL schedule for Athens–Leonidio line

Departure time from Athens to Astros					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	7:15	7:00	6:45	6:30
	15:39	15:45	15:39	15:39	15:39
	23:39	18:15	18:00	17:45	17:30
Tuesday	5:16	7:15	7:00	6:45	6:30
	15:39	15:45	15:39	15:39	15:39
	23:39	18:15	18:00	17:45	17:30
Wednesday	5:16	7:15	7:00	6:45	6:30
	15:39	15:45	15:39	15:39	15:39
	23:39	18:15	18:00	17:45	17:30
Thursday	5:16	7:15	7:00	6:45	6:30
	15:39	15:45	15:39	15:39	15:39
	23:39	18:15	18:00	17:45	17:30
Friday	5:16	7:15	7:00	6:45	6:30
	15:39	15:45	15:39	15:39	15:39

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	23:39	18:15	18:00	17:45	17:30
Saturday	5:16	7:15	7:00	6:45	6:30
	15:39	15:45	15:39	15:39	15:39
	23:39	18:15	18:00	17:45	17:30
Sunday	5:16	7:15	7:00	6:45	6:30
	15:39	15:45	15:39	15:39	15:39
	23:39	18:15	18:00	17:45	17:30
Departure time from Astros to Athens					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:12	7:00	7:03	7:03	7:03
	7:03	9:45	10:00	10:15	10:30
	11:03	17:45	18:00	18:15	18:30
Tuesday	5:12	7:00	7:03	7:03	7:03
	7:03	9:45	10:00	10:15	10:30
	11:03	17:45	18:00	18:15	18:30
Wednesday	4:03	7:00	7:03	7:03	7:03
	7:03	9:45	10:00	10:15	10:30
	11:03	17:45	18:00	18:15	18:30
Thursday	4:03	7:00	7:03	7:03	7:03
	7:03	9:45	10:00	10:15	10:30
	11:03	17:45	18:00	18:15	18:30
Friday	4:03	7:00	7:03	7:03	7:03
	7:03	9:45	10:00	10:15	10:30
	11:03	17:45	18:00	18:15	18:30
Saturday	4:03	7:00	7:03	7:03	7:03
	7:03	9:45	10:00	10:15	10:30
	11:03	17:45	18:00	18:15	18:30
Sunday	5:12	9:45	10:00	10:15	10:30
	7:03	17:45	18:00	18:15	18:30

Table 175: Optimized KTEL schedule for Athens–Astros line

Athens-Astros					
Departure	Day	Time	Time	Time	Arrival

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7:30	1	2	3	4	5	6	7	10:30
16:00	1	2	3	4	5	6	7	19:00
18:30	1	2	3	4	5	6	7	21:30
Astros-Athens								
Departure	Day						Arrival	
6:45	1	2	3	4	5	6	-	9:45
9:30	1	2	3	4	5	6	7	12:30
17:30	1	2	3	4	5	6	7	20:30

Table 176: Current KTEL schedule for Athens–Astros line

Departure time from Athens to Abndritsaina					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Friday	5:16	9:15	9:00	8:45	8:30
	15:39	16:45	16:30	16:15	16:00
Sunday	15:39	16:45	16:30	16:15	16:00
Departure time from Andritsaina to Athens					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	19:55	8:15	8:30	8:45	9:00
Tuesday	19:55	15:00	14:18	14:18	14:18
Wednesday	19:55	15:00	14:18	14:18	14:18
Thursday	19:55	15:00	14:18	14:18	14:18
Friday	19:55	12:00	12:15	12:15	12:15
Saturday	19:55	8:15	8:30	8:45	9:00
Sunday	19:55	15:00	14:18	14:18	14:18

Table 177: Optimized KTEL schedule for Athens–Andritsaina line

Athens-Andritsaina					
Departure	Day				Arrival
9:30	5				13:15
17:00	5		7		20:45
Andritsaina-Athens					
Departure	Day				Arrival
8:00	1		6		11:45
11:45	5				15:30

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14:45	2	3	4	7	18:30
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Table 178: Current KTEL schedule for Athens–Andritsaina line

Above, the resulted schedules for the fully relaxed, 30 minute window (± 15 min), 60 minute window (± 30 min), 90 minute window (± 45 min) and 120 minute window (± 60 min) case of Arkadia routes that are connected with Athens were presented. Additionally, the current schedule for every route was presented. What is more, as it was mentioned above, waiting time results tables for the aforementioned lines are grouped together as waiting time results between Athens and Arkadia prefecture routes.

	Fully relaxed	± 15 min	± 30 min	± 45 min	± 60 min	Current
Total waiting time	27,855	110,075	96,542	89,795	84,108	123,971
Av. Waiting time	67	251	221	205	193	283
Feasible transition	3,868	4,635	4,642	4,663	4,650	4,622

Table 179: Results table between Athens and Arkadia routes

	Fully relaxed	± 15 min	± 30 min	± 45 min	± 60 min	Current
Fully relaxed	0					
± 15min	-2.952	0				
± 30min	-2.466	0.123	0			
± 45min	-2.224	0.184	0.070	0		
± 60min	-2.019	0.236	0.129	0.063	0	
Current	-3.451	-0.126	-0.284	-0.381	-0.474	0

Table 180: Percentage difference of total waiting time between code variations from Athens to Arkadia destinations

In the above results of Arkadia routes connecting Athens, a reduction up to 345.1% is observed. More precisely, the percentage of decrease is 12.6% between current and 30 minute window case, 28.4% between current and 60 minute window case, 38.1% between current and 90 minute window case, 47.4% between current and 120 minute window case and 345.1% between current and fully relaxed case. The last one is equal to a decrease of about 96,116 minutes from the current total waiting time and a reduction of 216 minutes in average waiting time respectively. The aforementioned reduction of average waiting time is represented well by

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looking the values of current schedule and fully relaxed case which is 283 and 67 minutes respectively.

Departure time from Athens to Sparti					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	6:15	6:00	5:45	5:30
	9:43	8:15	8:00	7:45	7:30
	10:43	10:38	10:38	10:38	10:38
	12:39	13:00	12:45	12:39	12:39
	13:39	14:00	14:45	13:30	13:15
	15:39	16:00	15:45	15:39	15:39
	20:39	17:00	16:45	16:30	16:15
	22:27	18:00	18:45	19:00	17:15
	23:39	20:00	20:39	20:39	20:39
Tuesday	5:16	6:15	6:00	5:45	5:30
	6:16	8:15	8:00	7:45	7:30
	7:16	10:38	10:38	10:38	10:38
	10:38	13:00	12:45	12:39	12:39
	11:38	14:00	14:45	13:30	13:15
	12:39	16:00	15:45	15:39	15:39
	15:39	17:00	16:45	16:30	16:15
	20:39	18:00	18:45	19:00	17:15
	22:27	20:00	20:39	20:39	20:39
Wednesday	5:16	6:15	6:00	5:45	5:30
	6:16	8:15	8:00	7:45	7:30
	9:38	10:38	10:38	10:38	10:38
	10:38	13:00	12:45	12:39	12:39
	12:39	14:00	14:45	13:30	13:15
	15:39	16:00	15:45	15:39	15:39
	20:39	17:00	16:45	16:30	16:15
	22:27	18:00	18:45	19:00	17:15
	23:39	20:00	20:39	20:39	20:39

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Thursday	5:15	6:15	6:00	5:45	5:30
	6:15	8:15	8:00	7:45	7:30
	10:38	10:38	10:38	10:38	10:38
	11:38	13:00	12:45	12:39	12:39
	12:39	14:00	14:45	13:30	13:15
	15:39	16:00	15:45	15:39	15:39
	20:39	17:00	16:45	16:30	16:15
	22:27	18:00	18:45	19:00	17:15
	23:39	20:00	20:39	20:39	20:39
Friday	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:38	10:38	10:38	10:38	10:38
	15:38	13:00	12:45	12:39	12:39
	18:37	14:00	14:45	13:30	13:15
	19:37	16:00	15:45	15:39	15:39
	20:39	17:00	16:45	16:30	16:15
	22:27	18:00	18:45	19:00	17:15
	23:39	20:00	20:39	20:39	20:39
Saturday	5:16	6:15	6:00	5:45	5:30
	8:38	8:15	8:00	7:45	7:30
	9:38	10:38	10:38	10:38	10:38
	10:38	13:00	12:45	12:39	12:39
	11:39	14:00	14:45	13:30	13:15
	12:39	16:00	15:45	15:39	15:39
	15:38	17:00	16:45	16:30	16:15
	20:39	18:00	18:45	19:00	17:15
	22:27	20:00	20:39	20:39	20:39
Sunday	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:38	10:38	10:38	10:38	10:38
	15:38	13:00	12:45	12:39	12:39
	18:37	14:00	14:45	13:30	13:15
	19:37	16:00	15:45	15:39	15:39

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	20:39	17:00	16:45	16:30	16:15
	22:27	18:00	18:45	19:00	17:15
	23:39	20:00	20:39	19:37	19:37
Departure time from Sparti to Athens					
	<i>Variation</i>				
<i>Day</i>	<i>fully relaxed</i>	<i>±15min</i>	<i>±30min</i>	<i>±45min</i>	<i>±60min</i>
Monday	3:33	6:15	6:30	6:18	6:18
	4:42	7:15	7:30	6:33	6:33
	6:33	8:45	9:00	9:15	9:30
	10:33	10:18	10:18	10:18	10:18
	12:31	10:33	10:33	10:33	10:33
	13:33	13:30	13:45	12:31	12:31
	14:33	15:15	14:33	14:33	14:33
	19:30	17:15	17:30	17:45	18:00
	20:30	20:10	20:10	20:10	20:10
Tuesday	3:33	6:15	6:30	6:18	6:18
	4:42	7:15	7:30	6:33	6:33
	6:33	8:45	9:00	9:15	9:30
	9:33	10:18	10:18	10:18	10:18
	10:33	10:33	10:33	10:33	10:33
	12:31	13:30	13:45	12:31	12:31
	14:33	15:15	14:33	14:33	14:33
	19:30	17:15	17:30	17:45	18:00
	20:30	20:10	20:10	20:10	20:10
Wednesday	3:33	6:15	6:30	6:18	6:18
	4:42	7:15	7:30	6:33	6:33
	6:33	8:45	9:00	9:15	9:30
	9:33	10:18	10:18	10:18	10:18
	10:33	10:33	10:33	10:33	10:33
	12:31	13:30	13:45	12:31	12:31
	14:33	15:15	14:33	14:33	14:33
	19:30	17:15	17:30	17:45	18:00
	20:30	20:10	20:10	20:10	20:10

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Thursday	3:33	6:15	6:30	6:18	6:18
	4:42	7:15	7:30	6:33	6:33
	6:33	8:45	9:00	9:15	9:30
	9:33	10:18	10:18	10:18	10:18
	10:33	10:33	10:33	10:33	10:33
	12:31	13:30	13:45	12:31	12:31
	14:33	15:15	14:33	14:33	14:33
	19:30	17:15	17:30	17:45	18:00
20:30	20:10	20:10	20:10	20:10	
Friday	3:33	6:15	6:30	6:33	6:18
	4:42	7:15	7:30	7:33	6:33
	6:33	8:45	9:00	9:15	7:33
	7:33	10:18	10:18	10:18	10:18
	10:33	10:33	10:33	10:33	10:33
	12:31	13:30	13:45	12:31	12:31
	14:33	15:15	14:33	15:32	15:32
	15:32	17:15	17:30	17:45	18:00
20:10	20:10	20:10	20:10	20:10	
Saturday	3:33	6:15	6:30	6:18	6:18
	4:42	7:15	7:30	6:33	6:33
	6:33	8:45	9:00	9:15	9:30
	9:33	10:18	10:18	10:18	10:18
	10:33	10:33	10:33	10:33	10:33
	12:31	13:30	13:45	12:31	12:31
	14:33	15:15	14:33	14:33	14:33
	19:30	17:15	17:30	17:45	18:00
20:30	20:10	20:10	20:10	20:10	
Sunday	3:33	8:45	9:00	9:15	7:33
	4:42	10:18	10:18	10:18	10:18
	6:33	10:33	10:33	10:33	10:33
	7:33	13:30	13:45	12:31	12:31
	10:33	15:15	14:33	14:33	14:33
	12:31	17:15	17:30	17:45	18:00

	14:33	20:10	20:30	20:45	21:00
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Table 181: Optimized KTEL schedule for Athens–Sparti line

Athens-Sparti									
Departure	Day							Arrival	
6:30	1	2	3	4	5	6	7	10:00	
8:30	1	2	3	4	5	6	7	12:00	
10:30	1	2	3	4	5	6	7	14:00	
13:15	1	2	3	4	5	6	7	16:45	
14:15	1	2	3	4	5	6	7	17:45	
16:15	1	2	3	4	5	6	7	19:45	
17:15	1	2	3	4	5	6	7	20:45	
18:15	1	2	3	4	5	6	7	21:45	
20:15	1	2	3	4	5	6	7	23:45	
Sparti-Athens									
Departure	Day							Arrival	
6:00	1	2	3	4	5	6		9:30	
7:00	1	2	3	4	5	6		10:30	
8:30	1	2	3	4	5	6	7	12:00	
10:15	1	2	3	4	5	6	7	13:45	
10:30	1	2	3	4	5	6	7	14:00	
13:15	1	2	3	4	5	6	7	16:45	
15:00	1	2	3	4	5	6	7	18:30	
17:00	1	2	3	4	5	6	7	20:30	
20:00	1	2	3	4	5	6	7	23:30	

Table 182: Current KTEL schedule for Athens–Sparti line

Departure time from Athens to KEEM					
Day	Variation				
	<i>fully relaxed</i>	<i>±15min</i>	<i>±30min</i>	<i>±45min</i>	<i>±60min</i>
Monday	5:16	6:15	6:00	5:45	5:30
	9:43	8:15	8:00	7:45	7:30
	10:43	10:38	10:38	10:38	10:38
	12:39	13:00	12:45	12:39	12:39
	13:39	14:00	14:45	13:30	13:15

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	15:39	16:00	15:45	15:39	15:39
	20:39	17:00	16:45	16:30	16:15
	21:39	18:00	18:45	19:00	19:15
Tuesday	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:39	10:38	10:38	10:38	10:38
	15:39	13:00	12:45	12:39	12:39
	16:39	14:00	14:45	13:30	13:15
	17:39	16:00	15:45	15:39	15:39
	20:39	17:00	16:45	16:30	16:15
	21:39	18:00	18:45	19:00	19:15
Wednesday	5:16	6:15	6:00	5:45	5:30
	6:16	8:15	8:00	7:45	7:30
	7:16	10:38	10:38	10:38	10:38
	10:38	13:00	12:45	12:39	12:39
	12:39	14:00	14:45	13:30	13:15
	15:39	16:00	15:45	15:39	15:39
	20:39	17:00	16:45	16:30	16:15
	21:39	18:00	18:45	19:00	19:15
Thursday	5:16	6:15	6:00	5:45	5:30
	6:16	8:15	8:00	7:45	7:30
	7:16	10:38	10:38	10:38	10:38
	10:38	13:00	12:45	12:39	12:39
	12:39	14:00	14:45	13:30	13:15
	15:39	16:00	15:45	15:39	15:39
	20:39	17:00	16:45	16:30	16:15
	21:39	18:00	18:45	19:00	19:15
Friday	5:16	6:15	6:00	5:45	5:30
	6:16	8:15	8:00	7:45	7:30
	10:38	10:38	10:38	10:38	10:38
	12:39	13:00	12:45	12:39	12:39
	15:39	14:00	14:45	13:30	13:15

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	19:37	16:00	15:45	15:39	15:39
	20:39	17:00	16:45	16:30	16:15
	21:39	18:00	18:45	19:00	19:15
<i>Saturday</i>	5:16	6:15	6:00	5:45	5:30
	6:16	8:15	8:00	7:45	7:30
	7:16	10:38	10:38	10:38	10:38
	10:38	13:00	12:45	12:39	12:39
	12:39	14:00	14:45	13:30	13:15
	15:39	16:00	15:45	15:39	15:39
	20:39	17:00	16:45	16:30	16:15
	21:39	18:00	18:45	19:00	19:15
<i>Sunday</i>	5:16	6:15	6:00	5:45	5:30
	6:16	8:15	8:00	7:45	7:30
	10:38	10:38	10:38	10:38	10:38
	12:39	13:00	12:45	12:39	12:39
	15:39	14:00	14:45	13:30	13:15
	19:37	16:00	15:45	15:39	15:39
	20:39	17:00	16:45	16:30	16:15
	21:39	18:00	18:45	19:00	19:15
Departure time from KEEM to Athens					
<i>Day</i>	<i>Variation</i>				
	<i>fully relaxed</i>	<i>±15min</i>	<i>±30min</i>	<i>±45min</i>	<i>±60min</i>
<i>Monday</i>	3:18	8:00	8:15	8:30	8:45
	4:27	9:30	9:45	10:00	10:03
	6:18	10:18	10:18	10:18	10:18
	10:18	12:16	12:16	12:16	12:16
	12:16	14:18	14:18	14:18	14:18
	14:18	16:35	16:50	17:05	17:20
	20:15	19:35	19:50	19:55	19:55
<i>Tuesday</i>	3:18	8:00	8:15	8:30	8:45
	4:27	9:30	9:45	10:00	10:03
	6:18	10:18	10:18	10:18	10:18
	10:18	12:16	12:16	12:16	12:16

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	12:16	14:18	14:18	14:18	14:18
	14:18	16:35	16:50	17:05	17:20
	20:15	19:35	19:50	19:55	19:55
Wednesday	3:18	8:00	8:15	8:30	8:45
	4:27	9:30	9:45	10:00	10:03
	6:18	10:18	10:18	10:18	10:18
	10:18	12:16	12:16	12:16	12:16
	12:16	14:18	14:18	14:18	14:18
	14:18	16:35	16:50	17:05	17:20
	20:15	19:35	19:50	19:55	19:55
Thursday	3:18	8:00	8:15	8:30	8:45
	4:27	9:30	9:45	10:00	10:03
	6:18	10:18	10:18	10:18	10:18
	10:18	12:16	12:16	12:16	12:16
	12:16	14:18	14:18	14:18	14:18
	14:18	16:35	16:50	17:05	17:20
	20:15	19:35	19:50	19:55	19:55
Friday	4:27	8:00	7:18	7:18	7:18
	6:18	9:30	9:45	10:00	10:03
	7:18	10:18	10:18	10:18	10:18
	10:18	12:16	12:16	12:16	12:16
	12:16	14:18	14:18	14:18	14:18
	15:17	16:35	16:50	17:05	17:20
	20:15	19:35	19:50	19:55	19:55
Saturday	3:18	8:00	8:15	8:30	8:45
	4:27	9:30	9:45	10:00	10:03
	6:18	10:18	10:18	10:18	10:18
	10:18	12:16	12:16	12:16	12:16
	12:16	14:18	14:18	14:18	14:18
	14:18	16:35	16:50	17:05	17:20
	20:15	19:35	19:50	19:55	19:55
Sunday	3:18	8:00	7:18	7:18	7:18
	4:27	9:30	9:45	10:00	10:03

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	6:18	10:18	10:18	10:18	10:18
	7:18	12:16	12:16	12:16	12:16
	10:18	14:18	14:18	14:18	14:18
	12:16	16:35	16:50	17:05	17:20
	14:18	19:35	19:50	19:55	19:55

Table 183: Optimized KTEL schedule for Athens–KEEM line

Athens-KEEM								
Departure	Day							Arrival
6:30	1	2	3	4	5	6	7	10:15
8:30	1	2	3	4	5	6	7	12:15
10:30	1	2	3	4	5	6	7	14:15
13:15	1	2	3	4	5	6	7	17:00
14:15	1	2	3	4	5	6	7	18:00
16:15	1	2	3	4	5	6	7	20:00
17:15	1	2	3	4	5	6	7	21:00
18:15	1	2	3	4	5	6	7	22:00
KEEM-Athens								
Departure	Day							Arrival
7:45	1	2	3	4	5	6	7	11:30
9:15	1	2	3	4	5	6	7	13:00
10:15	1	2	3	4	5	6	7	14:00
12:20	1	2	3	4	5	6	7	16:05
14:10	1	2	3	4	5	6	7	17:55
16:20	1	2	3	4	5	6	7	20:05
19:20	1	2	3	4	5	6	7	23:05

Table 184: Current KTEL schedule for Athens–KEEM line

Departure time from Athens to Molaoi					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	6:15	6:00	5:45	5:30
	9:43	8:15	8:00	7:45	7:30
	10:43	10:38	10:38	10:38	10:38
	12:39	13:00	12:45	12:39	12:39
	15:39	16:00	15:45	15:39	15:39

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	20:56	17:00	17:45	16:30	16:15
Tuesday	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:39	10:38	10:38	10:38	10:38
	15:39	13:00	12:45	12:39	12:39
	20:39	16:00	15:45	15:39	15:39
	21:39	17:00	17:45	16:30	16:15
Wednesday	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:39	10:38	10:38	10:38	10:38
	15:39	13:00	12:45	12:39	12:39
	20:39	16:00	15:45	15:39	15:39
	21:39	17:00	17:45	16:30	16:15
Thursday	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:39	10:38	10:38	10:38	10:38
	15:39	13:00	12:45	12:39	12:39
	20:39	16:00	15:45	15:39	15:39
	21:39	17:00	17:45	16:30	16:15
Friday	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:39	10:38	10:38	10:38	10:38
	15:39	13:00	12:45	12:39	12:39
	19:37	16:00	15:45	15:39	15:39
	20:56	17:00	17:45	16:30	16:15
Saturday	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	9:30
	12:39	13:00	12:45	12:39	12:39
	15:39	16:00	15:45	15:39	15:39
	20:56	17:00	17:45	16:30	16:15
Sunday	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	9:30
	12:39	13:00	12:45	12:39	12:39

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	15:39	16:00	15:45	15:39	15:39
	20:56	17:00	17:45	16:30	16:15
Departure time from Molaoi to Athens					
	<i>Variation</i>				
<i>Day</i>	<i>fully relaxed</i>	<i>±15min</i>	<i>±30min</i>	<i>±45min</i>	<i>±60min</i>
Monday	5:03	5:03	5:03	5:03	5:03
	9:03	6:45	7:00	7:15	7:30
	11:01	8:30	8:45	9:00	9:03
	13:03	15:15	15:30	15:45	16:00
	19:00	18:15	18:30	18:40	18:40
Tuesday	3:12	5:03	5:03	5:03	5:03
	5:03	6:45	7:00	7:15	7:30
	11:01	8:30	8:45	9:00	9:03
	13:03	15:15	15:30	15:45	16:00
	19:00	18:15	18:30	18:40	18:40
Wednesday	2:03	5:03	5:03	5:03	5:03
	3:12	6:45	7:00	7:15	7:30
	11:01	8:30	8:45	9:00	9:03
	13:03	15:15	15:30	15:45	16:00
	19:00	18:15	18:30	18:40	18:40
Thursday	2:03	5:03	5:03	5:03	5:03
	3:12	6:45	7:00	7:15	7:30
	11:01	8:30	8:45	9:00	9:03
	13:03	15:15	15:30	15:45	16:00
	19:00	18:15	18:30	18:40	18:40
Friday	2:03	5:03	5:03	5:03	5:03
	3:12	6:45	6:03	6:03	6:03
	11:01	8:30	8:45	9:00	9:03
	14:02	15:15	15:30	15:45	14:02
	19:00	18:15	18:30	18:40	18:40
Saturday	2:03	6:45	7:00	7:15	7:30
	3:12	8:30	8:45	8:47	8:48
	11:01	9:00	9:03	9:03	9:03

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	18:40	18:15	18:30	18:40	18:40
Sunday	3:12	6:45	6:03	6:03	6:03
	5:03	8:30	8:45	8:47	8:48
	11:01	9:00	9:03	9:03	9:03
	13:03	15:15	15:30	15:45	16:00
	19:00	18:15	18:30	18:40	19:00

Table 185: Optimized KTEL schedule for Athens–Molaoi line

Athens-Molaoi								
Departure	Day							Arrival
6:30	1	2	3	4	5	6	7	11:30
8:30	1	2	3	4	5	6	7	13:30
10:30	1	2	3	4	5			15:30
13:15	1	2	3	4	5	6	7	18:15
16:15	1	2	3	4	5	6	7	21:15
17:15	1	2	3	4	5	6	7	22:15
Molaoi-Athens								
Departure	Day							Arrival
5:15	1	2	3	4	5			10:15
6:30	1	2	3	4	5	6	7	11:30
8:15	1	2	3	4	5	6	7	13:15
8:45						6	7	13:45
15:00	1	2	3	4	5		7	20:00
18:00	1	2	3	4	5	6	7	23:00

Table 186: Current KTEL schedule for Athens–Molaoi line

Departure time from Athens to Gytheio					
<i>Day</i>	<i>Variation</i>				
	<i>fully relaxed</i>	<i>±15min</i>	<i>±30min</i>	<i>±45min</i>	<i>±60min</i>
Monday	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:39	10:38	10:38	10:38	10:38
	15:39	14:00	13:45	13:30	13:15
	20:56	18:00	17:45	17:30	17:15
Tuesday	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:39	10:38	10:38	10:38	10:38

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	15:39	14:00	13:45	13:30	13:15
	20:56	18:00	17:45	17:30	17:15
<i>Wednesday</i>	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:39	10:38	10:38	10:38	10:38
	15:39	14:00	13:45	13:30	13:15
	20:56	18:00	17:45	17:30	17:15
<i>Thursday</i>	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:39	10:38	10:38	10:38	10:38
	15:39	14:00	13:45	13:30	13:15
	20:56	18:00	17:45	17:30	17:15
<i>Friday</i>	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:39	10:38	10:38	10:38	10:38
	15:39	14:00	13:45	13:30	13:15
	20:56	18:00	17:45	17:30	17:15
<i>Saturday</i>	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:39	10:38	10:38	10:38	10:38
	15:39	14:00	13:45	13:30	13:15
	20:56	18:00	17:45	17:30	17:15
<i>Sunday</i>	5:16	6:15	6:00	5:45	5:30
	10:38	8:15	8:00	7:45	7:30
	12:39	10:38	10:38	10:38	10:38
	15:39	14:00	13:45	13:30	13:15
	20:56	18:00	17:45	17:30	17:15
Departure time from Gytheio to Athens					
	<i>Variation</i>				
<i>Day</i>	<i>fully relaxed</i>	<i>±15min</i>	<i>±30min</i>	<i>±45min</i>	<i>±60min</i>
	2:32	7:45	8:00	8:15	8:30
<i>Monday</i>	3:42	9:30	9:33	9:33	9:33
	9:33	12:15	11:31	11:31	11:31

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	11:31	14:15	13:33	13:33	13:33
	13:33	16:15	16:30	16:45	17:00
	19:30	19:10	19:10	19:10	19:10
Tuesday	2:32	7:45	8:00	8:15	8:30
	3:42	9:30	9:33	9:33	9:33
	9:33	12:15	11:31	11:31	11:31
	11:31	14:15	13:33	13:33	13:33
	13:33	16:15	16:30	16:45	17:00
	19:30	19:10	19:10	19:10	19:10
Wednesday	2:33	7:45	8:00	8:15	8:30
	3:42	9:30	9:33	9:33	9:33
	5:33	12:15	11:31	11:31	11:31
	11:31	14:15	13:33	13:33	13:33
	13:33	16:15	16:30	16:45	17:00
	19:30	19:10	19:10	19:10	19:10
Thursday	2:33	7:45	8:00	8:15	8:30
	3:42	9:30	9:33	9:33	9:33
	5:33	12:15	11:31	11:31	11:31
	11:31	14:15	13:33	13:33	13:33
	13:33	16:15	16:30	16:45	17:00
	19:30	19:10	19:10	19:10	19:10
Friday	2:33	7:45	8:00	8:15	6:33
	3:42	9:30	9:33	9:33	9:33
	5:33	12:15	11:31	11:31	11:31
	11:31	14:15	13:33	14:32	14:32
	14:32	16:15	16:30	16:45	17:00
	19:30	19:10	19:10	19:10	19:10
Saturday	2:33	7:45	8:00	8:15	8:30
	3:42	9:30	9:33	9:33	9:33
	5:33	12:15	11:31	11:31	11:31
	11:31	14:15	13:33	13:33	13:33
	13:33	16:15	16:30	16:45	17:00

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	19:30	19:10	19:10	19:10	19:10
<i>Sunday</i>	2:33	7:45	8:00	8:15	6:33
	3:42	9:30	9:33	9:33	9:33
	5:33	12:15	11:31	11:31	11:31
	11:31	14:15	13:33	13:33	13:33
	13:33	16:15	16:30	16:45	17:00
	19:30	19:10	19:10	19:10	19:10

Table 187: Optimized KTEL schedule for Athens–Gytheio line

Athens-Gytheio								
Departure	Day							Arrival
6:30	1	2	3	4	5	6	7	11:00
8:30	1	2	3	4	5	6	7	13:00
10:30	1	2	3	4	5	6	7	15:00
14:15	1	2	3	4	5	6	7	18:45
18:15	1	2	3	4	5	6	7	22:45
Gytheio-Athens								
Departure	Day							Arrival
7:30	1	2	3	4	5	6	7	12:00
9:15	1	2	3	4	5	6	7	13:45
12:00	1	2	3	4	5	6	7	16:30
14:00	1	2	3	4	5	6	7	18:30
16:00	1	2	3	4	5	6	7	20:30
19:00	1	2	3	4	5	6	7	23:30

Table 188: Current KTEL schedule for Athens–Gytheio line

Departure time from Athens to Areopoli					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
<i>Monday</i>	10:38	6:15	6:00	5:45	5:30
	15:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
<i>Tuesday</i>	5:16	6:15	6:00	5:45	5:30
	12:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
<i>Wednesday</i>	5:16	6:15	6:00	5:45	5:30

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	12:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
Thursday	5:16	6:15	6:00	5:45	5:30
	12:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
Friday	5:16	6:15	6:00	5:45	5:30
	12:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
Saturday	5:16	6:15	6:00	5:45	5:30
	12:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
Sunday	5:16	6:15	6:00	5:45	5:30
	12:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
Departure time from Areopoli to Athens					
	<i>Variation</i>				
<i>Day</i>	<i>fully relaxed</i>	<i>±15min</i>	<i>±30min</i>	<i>±45min</i>	<i>±60min</i>
Monday	10:01	8:45	8:03	8:03	8:03
	12:03	15:30	15:45	16:00	16:15
	17:40	18:15	17:40	17:40	17:40
Tuesday	2:12	8:45	8:03	8:03	8:03
	10:01	15:30	15:45	16:00	16:15
	17:40	18:15	17:40	17:40	17:40
Wednesday	2:12	8:45	8:03	8:03	8:03
	10:01	15:30	15:45	16:00	16:15
	17:40	18:15	17:40	17:40	17:40
Thursday	2:12	8:45	8:03	8:03	8:03
	10:01	15:30	15:45	16:00	16:15
	17:40	18:15	17:40	17:40	17:40
Friday	2:12	8:45	8:03	8:03	8:03
	10:01	15:30	15:45	16:00	16:15
	17:40	18:15	17:40	17:40	17:40
Saturday	2:12	8:45	8:03	8:03	8:03

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	10:01	15:30	15:45	16:00	16:15
	17:40	18:15	17:40	17:40	17:40
Sunday	2:12	8:45	8:03	8:03	8:03
	10:01	15:30	15:45	16:00	16:15
	17:40	17:40	17:40	17:40	19:00

Table 189: Optimized KTEL schedule for Athens–Areopoli line

Athens-Areopoli									
Departure	Day							Arrival	
6:30	1	2	3	4	5	6	7	12:30	
8:30	1	2	3	4	5	6	7	14:30	
14:15	1	2	3	4	5	6	7	20:15	
Areopoli-Athens									
Departure	Day							Arrival	
8:30	1	2	3	4	5	6	7	14:30	
15:15	1	2	3	4	5	6	7	21:15	
18:00	1	2	3	4	5	6	7	0:00	

Table 190: Current KTEL schedule for Athens–Areopoli line

Departure time from Athens to Neapoli					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	10:38	6:15	6:00	5:45	5:30
	15:39	13:00	12:45	12:39	12:39
	20:56	16:00	15:45	15:39	15:39
Tuesday	5:16	6:15	6:00	5:45	5:30
	12:39	13:00	12:45	12:39	12:39
	20:56	16:00	15:45	15:39	15:39
Wednesday	5:16	6:15	6:00	5:45	5:30
	12:39	13:00	12:45	12:39	12:39
	20:56	16:00	15:45	15:39	15:39
Thursday	5:16	6:15	6:00	5:45	5:30
	12:38	13:00	12:45	12:39	12:39
	20:56	16:00	15:45	15:39	15:39
Friday	5:16	6:15	6:00	5:45	5:30
	12:39	13:00	12:45	12:39	12:39

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Departure	Day							Arrival
6:30	1	2	3	4	5	6	7	12:30
13:15	1	2	3	4	5	6	7	19:15
16:15	1	2	3	4	5	6	7	22:15
Neapoli-Athens								
Departure	Day							Arrival
7:15	1	2	3	4	5	6	7	13:15
14:00	1	2	3	4	5	6	7	20:00
17:15	1	2	3	4	5	6	7	23:15

Table 192: Current KTEL schedule for Athens–Neapoli line

Departure time from Athens to Monemvasia						
Day	Variation					
	fully relaxed	±15min	±30min	±45min	±60min	
Monday	5:16	6:15	6:00	5:45	5:30	
	10:38	8:15	8:00	7:45	7:30	
	15:39	10:38	10:38	10:38	10:38	
	20:56	17:00	16:45	16:30	16:15	
Tuesday	5:16	6:15	6:00	5:45	5:30	
	12:39	8:15	8:00	7:45	7:30	
	15:39	10:38	10:38	10:38	10:38	
	20:56	17:00	16:45	16:30	16:15	
Wednesday	5:16	6:15	6:00	5:45	5:30	
	12:39	8:15	8:00	7:45	7:30	
	15:39	10:38	10:38	10:38	10:38	
	20:56	17:00	16:45	16:30	16:15	
Thursday	5:16	6:15	6:00	5:45	5:30	
	12:39	8:15	8:00	7:45	7:30	
	15:39	10:38	10:38	10:38	10:38	
	20:56	17:00	16:45	16:30	16:15	
Friday	5:16	6:15	6:00	5:45	5:30	
	12:39	8:15	8:00	7:45	7:30	
	15:39	10:38	10:38	10:38	10:38	
	20:56	17:00	16:45	16:30	16:15	

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Saturday	5:16	6:15	6:00	5:45	5:30
	12:39	8:15	8:00	7:45	7:30
	15:39	10:38	10:38	10:38	10:38
	20:56	17:00	16:45	16:30	16:15
Sunday	10:38	6:15	6:00	5:45	5:30
	15:39	10:38	10:38	10:38	10:38
	20:56	17:00	16:45	16:30	16:15
Departure time from Monemvasia to Athens					
Day	<i>Variation</i>				
	<i>fully relaxed</i>	<i>±15min</i>	<i>±30min</i>	<i>±45min</i>	<i>±60min</i>
Monday	8:32	4:33	4:33	4:33	4:33
	10:31	7:30	7:45	8:00	8:15
	12:33	14:30	14:45	15:00	15:15
	18:10	17:45	18:00	18:10	18:10
Tuesday	2:42	4:33	4:33	4:33	4:33
	4:33	7:30	7:45	8:00	8:15
	10:31	14:30	14:45	15:00	15:15
	18:10	17:45	18:00	18:10	18:10
Wednesday	1:33	4:33	4:33	4:33	4:33
	2:42	7:30	7:45	8:00	8:15
	10:31	14:30	14:45	15:00	15:15
	18:10	17:45	18:00	18:10	18:10
Thursday	1:33	4:33	4:33	4:33	4:33
	2:42	7:30	7:45	8:00	8:15
	10:31	14:30	14:45	15:00	15:15
	18:10	17:45	18:00	18:10	18:10
Friday	1:33	4:33	4:33	4:33	4:33
	2:42	7:30	7:45	8:00	8:15
	10:31	14:30	14:45	13:32	13:32
	18:10	17:45	18:00	18:10	18:10
Saturday	1:33	4:33	4:33	4:33	4:33
	2:42	7:30	7:45	8:00	8:15
	10:31	14:30	14:45	15:00	15:15

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	18:10	17:45	18:00	18:10	18:10
Sunday	10:31	7:30	7:45	8:00	8:15
	12:33	14:30	14:45	15:00	15:15
	18:10	17:45	18:00	18:10	18:10

Table 193: Optimized KTEL schedule for Athens–Monemvasia line

Athens-Monemvasia									
Departure	Day							Arrival	
6:30	1	2	3	4	5	6	7	12:00	
8:30	1	2	3	4	5	6		14:00	
10:30	1	2	3	4	5	6	7	16:00	
17:15	1	2	3	4	5	6	7	22:45	
Monemvasia-Athens									
Departure	Day							Arrival	
4:45	1	2	3	4	5	6		10:15	
7:15	1	2	3	4	5	6	7	12:45	
14:15	1	2	3	4	5	6	7	19:45	
17:30	1	2	3	4	5	6	7	23:00	

Table 194: Current KTEL schedule for Athens–Monemvasia line

Departure time from Athens to Gerolimenas					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	6:15	6:00	5:45	5:30
	15:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
Tuesday	5:16	6:15	6:00	5:45	5:30
	12:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
Wednesday	5:16	6:15	6:00	5:45	5:30
	12:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
Thursday	5:16	6:15	6:00	5:45	5:30
	12:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
Friday	5:16	6:15	6:00	5:45	5:30

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	12:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
Saturday	5:16	6:15	6:00	5:45	5:30
	12:39	8:15	8:00	7:45	9:30
	20:55	14:00	13:45	13:30	13:15
Sunday	10:38	6:15	6:00	5:45	5:30
	15:39	8:15	8:00	7:45	9:30
	20:56	14:00	13:45	13:30	13:15
Departure time from Gerolimenas to Athens					
	<i>Variation</i>				
<i>Day</i>	<i>fully relaxed</i>	<i>±15min</i>	<i>±30min</i>	<i>±45min</i>	<i>±60min</i>
Monday	9:31	7:00	7:15	7:30	7:33
	11:33	14:45	15:00	15:15	15:31
	17:10	17:10	17:10	17:10	17:10
Tuesday	1:42	7:00	7:15	7:30	7:33
	9:31	14:45	15:00	15:15	15:30
	17:10	17:10	17:10	17:10	17:10
Wednesday	1:42	7:00	7:15	7:30	7:33
	9:31	14:45	15:00	15:15	15:31
	17:10	17:10	17:10	17:10	17:10
Thursday	1:42	7:00	7:15	7:30	7:33
	9:31	14:45	15:00	15:15	15:31
	17:10	17:10	17:10	17:10	17:10
Friday	1:42	7:00	7:15	7:30	7:33
	9:30	14:45	15:00	15:15	15:31
	17:10	17:10	17:10	17:10	17:10
Saturday	1:42	7:00	7:15	7:30	7:33
	9:31	14:45	15:00	15:15	15:31
	17:10	17:10	17:10	17:10	17:10
Sunday	1:42	7:00	7:15	7:30	7:33
	9:31	14:45	15:00	15:15	15:31
	17:10	17:10	17:10	17:10	18:00

Table 195: Optimized KTEL schedule for Athens–Gerolimenas line

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Athens-Gerolimenas								
Departure	Day							Arrival
6:30	1	2	3	4	5	6	7	13:00
8:30	1	2	3	4	5	6	7	15:00
14:15	1	2	3	4	5	6	7	20:45
Gerolimenas-Athens								
Departure	Day							Arrival
6:45	1	2	3	4	5	6	7	13:15
14:30	1	2	3	4	5	6	7	21:00
17:00	1	2	3	4	5	6	7	23:30

Table 196: Current KTEL schedule for Athens–Gerolimenas line

Above, the resulted schedules for the fully relaxed, 30 minute window (± 15 min), 60 minute window (± 30 min), 90 minute window (± 45 min) and 120 minute window (± 60 min) case of Lakonia routes connected with Athens were presented. Additionally, the current schedule for every route was presented. What is more, as it was mentioned above, waiting time results tables for the aforementioned lines are grouped together as waiting time results between Athens and Lakonia prefecture routes.

	Fully relaxed	± 15 min	± 30 min	± 45 min	± 60 min	Current
Total waiting time	21,322	123,041	103,640	96,778	90,803	141,880
Av. Waiting time	33	188	159	149	140	216
Feasible transitions	5,787	6,926	6,968	6,964	6,963	6,917

Table 197: Results table between Athens and Lakonia routes

	Fully relaxed	± 15 min	± 30 min	± 45 min	± 60 min	Current
Fully relaxed	0					
± 15min	-4.771	0				
± 30min	-3.861	0.158	0			
± 45min	-3.539	0.213	0.066	0		
± 60min	-3.259	0.262	0.124	0.062	0	
Current	-5.654	-0.153	-0.369	-0.466	-0.563	0

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Table 198: Percentage difference of total waiting time between code variations from Athens to Lakonia destinations

In the above results of Lakonia routes connecting Athens, a reduction up to 565.4% is observed. More precisely, the percentage of decrease is 15.3% between current and 30 minute window case, 36.9% between current and 60 minute window case, 46.6% between current and 90 minute window case, 56.3% between current and 120 minute window case and 565.4% between current and fully relaxed case. The last one is equal to a decrease of about 120,558 minutes from the current total waiting time and a reduction of 183 minutes in average waiting time respectively. This reduction leads to a value of average waiting time equal to only 33 minutes in fully relaxed case. The same value in the current schedule is 216 minutes.

Departure time from Athens to Kalamata					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	6:00	5:45	5:30	5:16
	6:31	7:45	7:00	6:45	6:30
	7:46	8:45	8:30	9:43	9:43
	9:43	10:38	10:00	10:43	10:43
	10:58	11:38	11:15	11:43	12:39
	12:39	12:45	12:39	12:43	13:39
	14:24	14:00	13:45	13:43	14:39
	15:39	15:39	15:39	15:39	15:39
	16:54	16:39	16:39	16:39	16:39
	18:09	17:45	18:30	17:39	17:39
	19:24	19:15	20:00	18:45	18:39
20:39	21:15	21:00	20:45	22:26	
Tuesday	5:16	6:00	5:45	5:30	5:16
	6:31	7:45	7:00	6:45	6:30
	7:46	8:45	8:30	8:15	8:00
	9:01	10:38	10:38	10:38	10:38
	10:38	11:38	11:38	11:38	11:38
	12:39	12:45	12:39	12:39	12:39
	13:54	14:00	13:45	13:39	13:39
	15:39	15:39	15:39	15:39	14:39

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	16:54	16:39	16:39	16:39	15:39
	18:09	17:45	18:30	17:39	17:00
	19:24	19:15	20:00	18:45	18:39
	20:39	21:15	21:00	20:45	22:27
Wednesday	5:16	6:00	5:45	5:30	5:16
	6:31	7:45	7:00	6:45	6:30
	7:46	8:45	8:30	8:15	8:00
	9:01	10:38	10:38	10:38	10:38
	10:38	11:38	11:38	11:38	11:38
	12:39	12:45	12:39	12:39	12:39
	13:54	14:00	13:45	13:39	13:39
	15:39	15:39	15:39	15:39	14:39
	16:54	16:39	16:39	16:39	15:39
	18:09	17:45	18:30	17:39	17:00
	19:24	19:15	20:00	18:45	18:39
20:39	21:15	21:00	20:45	22:27	
Thursday	5:16	6:00	5:45	5:30	5:16
	6:31	7:45	7:00	6:45	6:30
	7:46	8:45	8:30	8:15	8:00
	9:01	10:38	10:38	10:38	10:38
	10:38	11:38	11:38	11:38	11:38
	12:39	12:45	12:39	12:39	12:39
	13:54	14:00	13:45	13:39	13:39
	15:39	15:39	15:39	15:39	14:39
	16:54	16:39	16:39	16:39	15:39
	18:09	17:45	18:30	17:39	17:00
	19:24	19:15	20:00	18:45	18:39
20:39	21:15	21:00	20:45	22:27	
Friday	5:16	6:00	5:45	5:30	5:16
	6:31	7:45	7:00	6:45	6:30
	7:46	8:45	8:30	8:15	8:00
	9:01	10:38	10:38	10:38	10:38

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	10:38	11:38	11:38	11:38	11:38
	12:39	12:45	12:39	12:39	12:39
	14:24	14:00	13:45	13:39	13:39
	15:39	15:39	15:39	15:39	14:39
	17:06	16:39	16:39	16:39	15:39
	18:21	17:45	17:39	17:39	17:00
	19:37	19:37	19:37	19:37	19:37
	20:51	21:15	21:00	20:45	22:27
Saturday	5:16	6:00	5:45	5:30	5:15
	6:31	7:45	7:00	6:45	6:30
	7:46	8:45	8:30	8:15	8:00
	9:01	10:38	10:38	10:38	10:38
	10:38	11:38	11:38	11:38	11:38
	12:39	12:45	12:39	12:39	12:39
	13:54	14:00	13:45	13:39	13:39
	15:39	15:39	15:39	15:39	14:39
	16:54	16:39	16:39	16:39	15:39
	18:09	17:45	18:30	17:39	17:00
	19:23	19:15	20:00	18:45	18:39
20:39	21:15	21:00	20:45	22:27	
Sunday	5:16	7:15	7:00	6:45	6:30
	6:31	8:45	8:30	8:15	8:00
	7:46	10:38	10:38	10:38	10:38
	9:01	11:38	11:38	11:38	11:38
	10:38	12:45	12:39	12:39	12:39
	12:39	14:00	13:45	13:39	13:39
	13:54	15:39	15:39	15:39	14:39
	15:39	16:39	16:39	16:39	15:39
	16:54	17:45	17:39	17:39	17:00
	18:09	19:37	19:37	19:37	19:37
	19:37	21:15	21:00	20:45	20:36
Departure time from Kalamata to Athens					
Day	Variation				

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	fully relaxed	±15min	±30min	±45min	±60min
Monday	2:27	4:37	4:37	4:37	4:37
	3:42	6:28	6:28	6:28	6:28
	4:57	8:15	8:28	8:28	9:00
	6:48	9:28	9:28	9:28	10:26
	9:32	10:28	10:28	10:28	11:26
	10:48	12:15	12:26	12:26	12:26
	12:18	13:45	14:00	13:28	13:28
	13:33	15:15	15:30	14:28	14:28
	14:48	16:45	17:00	17:15	17:30
	19:35	18:15	18:30	18:45	19:00
	20:50	19:45	20:00	20:05	20:05
	22:05	22:00	22:15	22:30	22:45
Tuesday	2:27	4:37	4:37	4:37	4:37
	3:42	6:28	6:28	6:28	6:28
	4:57	8:15	8:28	8:28	9:00
	6:48	9:28	9:28	9:28	10:26
	9:33	10:28	10:28	10:28	11:26
	10:48	12:15	12:26	12:26	12:26
	12:18	13:45	14:00	13:28	13:28
	13:33	15:15	15:30	14:28	14:28
	14:48	16:45	17:00	17:15	17:30
	19:35	18:15	18:30	18:45	19:00
	20:50	19:45	20:00	20:05	20:05
	22:05	22:00	22:15	22:30	22:45
Wednesday	2:27	4:37	4:37	4:37	4:37
	3:42	6:28	6:28	6:28	6:28
	4:57	8:15	8:28	8:28	9:00
	6:48	9:28	9:28	9:28	10:26
	9:33	10:28	10:28	10:28	11:26
	10:48	12:15	12:26	12:26	12:26
	12:18	13:45	14:00	13:28	13:28

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	13:33	15:15	15:30	14:28	14:28
	14:48	16:45	17:00	17:15	17:30
	19:35	18:15	18:30	18:45	19:00
	20:50	19:45	20:00	20:05	20:05
	22:05	22:00	22:15	22:30	22:45
	2:27	4:37	4:37	4:37	4:37
	3:42	6:28	6:28	6:28	6:28
	4:57	8:15	8:28	8:28	9:00
	6:48	9:28	9:28	9:28	10:26
	9:33	10:28	10:28	10:28	11:26
	10:48	12:15	12:26	12:26	12:26
Thursday	12:18	13:45	14:00	13:28	13:28
	13:33	15:15	15:30	14:28	14:28
	14:48	16:45	17:00	17:15	17:30
	19:35	18:15	18:30	18:45	19:00
	20:50	19:45	20:00	20:05	20:05
	22:05	22:00	22:15	22:30	22:45
	3:42	4:37	4:37	4:37	4:37
	4:57	6:28	6:28	6:28	6:28
	6:33	8:15	8:28	7:28	7:28
	7:48	9:28	9:28	9:28	9:28
	9:33	10:28	10:28	10:28	10:28
	10:48	12:15	12:26	12:25	12:26
Friday	12:46	13:45	14:00	14:15	14:28
	14:32	15:15	15:27	15:27	15:27
	15:47	16:45	17:00	17:15	17:30
	19:35	18:15	18:30	18:45	19:00
	20:50	19:45	20:00	20:05	20:05
	22:05	22:00	22:15	22:30	22:45
	2:27	4:37	4:37	4:37	4:37
Saturday	3:42	6:28	6:28	6:28	6:28
	4:57	8:15	8:28	8:28	9:00

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	6:48	9:28	9:28	9:28	10:25
	9:33	10:28	10:28	10:28	11:25
	10:48	12:15	12:26	12:26	12:25
	12:18	13:45	14:00	13:27	13:28
	13:33	15:15	15:30	14:27	14:28
	14:48	16:45	17:00	17:15	17:30
	19:35	18:15	18:30	18:45	19:00
	20:50	19:45	20:00	20:05	20:05
	22:05	22:00	22:15	22:30	22:45
Sunday	3:42	6:28	6:28	6:28	6:28
	4:57	8:15	8:28	7:28	7:28
	6:32	9:28	9:28	8:28	9:28
	7:47	10:28	10:28	9:28	10:28
	9:33	12:15	12:26	10:28	12:26
	10:48	13:45	14:00	13:27	13:28
	12:46	15:15	15:30	14:27	14:27
	14:48	16:45	17:00	17:15	17:30
	19:35	18:15	18:30	18:45	19:00
	20:50	19:45	20:00	20:15	20:30
	22:05	22:00	21:15	22:30	22:45

Table 199: Optimized KTEL schedule for Athens–Kalamata line

Athens-Kalamata								
Departure	Day							Arrival
6:15	1	2	3	4	5	6		9:30
7:30	1	2	3	4	5	6	7	10:45
9:00	1	2	3	4	5	6	7	12:15
10:30	1	2	3	4	5	6	7	13:45
11:45	1	2	3	4	5	6	7	15:00
13:00	1	2	3	4	5	6	7	16:15
14:15	1	2	3	4	5	6	7	17:30
15:30	1	2	3	4	5	6	7	18:45
16:30	1	2	3	4	5	6	7	19:45
18:00	1	2	3	4	5	6	7	21:15
19:30	1	2	3	4	5	6	7	22:45

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21:30	1	2	3	4	5	6	7	0:45
Kalamata-Athens								
Departure	Day							Arrival
4:45	1	2	3	4	5	6		8:00
6:30	1	2	3	4	5	6	7	9:45
8:00	1	2	3	4	5	6	7	11:15
9:30	1	2	3	4	5	6	7	12:45
10:30	1	2	3	4	5	6	7	13:45
12:00	1	2	3	4	5	6	7	15:15
13:30	1	2	3	4	5	6	7	16:45
15:00	1	2	3	4	5	6	7	18:15
16:30	1	2	3	4	5	6	7	19:45
18:00	1	2	3	4	5		7	21:15
19:30	1	2	3	4	5	6	7	22:45
21:45	1	2	3	4	5	6	7	1:00

Table 200: Current KTEL schedule for Athens–Kalamata line

Departure time from Athens to Messini					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	9:15	9:00	8:45	8:30
Tuesday	5:16	9:15	9:00	8:45	8:30
Wednesday	5:16	9:15	9:00	8:45	8:30
Thursday	5:16	9:15	9:00	8:45	8:30
Friday	5:16	9:15	9:00	8:45	8:30
Saturday	5:16	9:15	9:00	8:45	8:30
Sunday	5:16	9:15	9:00	8:45	8:30
Departure time from Messini to Athens					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	19:40	8:45	9:00	9:15	9:30
Tuesday	19:40	8:45	9:00	9:15	9:30
Wednesday	19:40	8:45	9:00	9:15	9:30
Thursday	19:40	8:45	9:00	9:15	9:30

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Friday	19:40	8:45	9:00	9:15	9:30
Saturday	19:40	8:45	9:00	9:15	9:30
Sunday	19:40	8:45	9:00	9:15	9:30

Table 201: Optimized KTEL schedule for Athens–Messini line

Athens-Messini								
Departure	Day						Arrival	
9:30	1	2	3	4	5	6	7	13:30
Messini-Athens								
Departure	Day						Arrival	
8:30	1	2	3	4	5	6	7	12:30

Table 202: Current KTEL schedule for Athens–Messini line

Departure time from Athens to Pylos					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	9:15	9:43	9:43	9:43
	10:16	15:39	15:39	15:39	15:39
Tuesday	5:16	9:15	9:00	8:45	8:30
	10:16	15:39	15:39	15:39	15:39
Wednesday	5:16	9:15	9:00	8:45	8:30
	10:16	15:39	15:39	15:39	15:39
Thursday	5:16	9:15	9:00	8:45	8:30
	10:16	15:39	15:39	15:39	15:39
Friday	5:16	9:15	9:00	8:45	8:30
	10:16	15:39	15:39	15:39	15:39
Saturday	5:16	9:15	9:00	8:45	8:30
	10:16	15:39	15:39	15:39	15:39
Sunday	5:16	9:15	9:00	8:45	8:30
	10:16	15:39	15:39	15:39	15:39
Departure time from Pylos to Athens					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	18:55	9:15	9:18	9:18	9:18
Tuesday	18:55	9:15	9:18	9:18	9:18
Wednesday	18:55	9:15	9:18	9:18	9:18

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Thursday	18:55	9:15	9:18	9:18	9:18
Friday	18:55	9:15	9:18	9:18	9:18
Saturday	18:55	9:15	9:18	9:18	9:18
Sunday	18:55	9:15	9:18	9:18	9:18

Table 203: Optimized KTEL schedule for Athens–Pylos line

Athens-Pylos								
Departure	Day							Arrival
9:30	1	2	3	4	5	6	7	14:15
15:30	1	2	3	4	5	6	7	20:15
Pylos-Athens								
Departure	Day							Arrival
9:00	1	2	3	4	5	6	7	13:45

Table 204: Current KTEL schedule for Athens–Pylos line

Departure time from Athens to Koroni					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	7:15	7:00	6:45	6:30
Tuesday	5:16	7:15	7:00	6:45	6:30
Wednesday	5:16	7:15	7:00	6:45	6:30
Thursday	5:16	7:15	7:00	6:45	6:30
Friday	5:16	7:15	7:00	6:45	6:30
Saturday	5:16	7:15	7:00	6:45	6:30
Sunday	5:16	7:15	7:00	6:45	6:30
Departure time from Koroni to Athens					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	18:55	8:10	8:25	8:40	8:55
Tuesday	18:55	8:10	8:25	8:40	8:55
Wednesday	18:55	8:10	8:25	8:40	8:55
Thursday	18:55	8:10	8:25	8:40	8:55
Friday	18:55	8:10	8:25	8:40	8:55
Saturday	18:55	8:10	8:25	8:40	8:55
Sunday	18:55	8:10	8:25	8:40	8:55

Table 205: Optimized KTEL schedule for Athens–Koroni line

Athens-Koroni									
Departure	Day							Arrival	
7:30	1	2	3	4	5	6	7	12:15	
Koroni-Athens									
Departure	Day							Arrival	
7:55	1	2	3	4	5	6	7	12:40	

Table 206: Current KTEL schedule for Athens–Koroni line

Departure time from Athens to Gargalianoi					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	7:45	7:30	7:15	7:00
	10:38	11:45	11:30	12:39	11:00
	15:39	15:45	15:39	15:39	15:39
	20:39	19:45	19:30	20:39	20:39
Tuesday	5:16	7:45	7:30	7:15	7:00
	10:38	11:45	11:30	12:39	12:39
	15:39	15:45	15:39	15:39	15:39
	20:39	19:45	19:30	20:39	20:39
Wednesday	5:16	7:45	7:30	7:15	7:00
	10:38	11:45	11:30	12:39	12:39
	15:39	15:45	15:39	15:39	15:39
	20:39	19:45	19:30	20:39	20:39
Thursday	5:16	7:45	7:30	7:15	7:00
	10:38	11:45	11:30	12:39	12:39
	15:39	15:45	15:39	15:39	15:39
	20:39	19:45	19:30	20:39	20:39
Friday	5:16	7:45	7:30	7:15	7:00
	10:38	11:45	11:30	12:39	12:39
	15:39	15:45	15:39	15:39	15:39
	20:39	19:45	19:37	20:39	20:39
Saturday	5:16	7:45	7:30	7:15	7:00
	10:38	11:45	11:30	12:39	12:39

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	15:39	15:45	15:39	15:39	15:39
	20:39	19:45	19:30	20:39	20:39
Sunday	5:16	7:45	7:30	7:15	7:00
	10:38	11:45	11:30	12:39	12:39
	15:39	15:45	15:39	15:39	15:39
	20:39	19:45	19:30	19:15	19:00
Departure time from Gargalianoi to Athens					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	11:31	6:30	6:45	5:33	5:33
	13:33	10:15	9:33	9:33	9:33
	19:10	14:45	15:00	15:15	13:33
	20:25	18:15	18:30	18:45	19:00
Tuesday	11:31	6:30	6:45	5:33	5:33
	13:33	10:15	9:33	9:33	9:33
	19:10	14:45	15:00	15:15	13:33
	20:25	18:15	18:30	18:45	19:00
Wednesday	11:31	6:30	6:45	5:33	5:33
	13:33	10:15	9:33	9:33	9:33
	19:10	14:45	15:00	15:15	13:33
	20:25	18:15	18:30	18:45	19:00
Thursday	11:31	6:30	6:45	5:33	5:33
	13:33	10:15	9:33	9:33	9:33
	19:10	14:45	15:00	15:15	13:33
	20:25	18:15	18:30	18:45	19:00
Friday	11:31	6:30	6:33	5:33	5:33
	14:32	10:15	9:33	9:33	9:33
	19:10	14:32	14:32	14:32	14:32
	20:25	18:15	18:30	18:45	19:00
Saturday	11:31	6:30	6:45	5:33	5:33
	13:33	10:15	9:33	9:33	9:33
	19:10	14:45	15:00	15:15	13:33
	20:25	18:15	18:30	18:45	19:00

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Sunday	9:33	6:30	6:33	6:33	5:33
	11:31	10:15	9:33	9:33	9:33
	13:33	14:45	15:00	15:15	13:33
	19:10	16:15	16:30	16:45	17:00
	20:25	18:15	18:30	18:45	19:00

Table 207: Optimized KTEL schedule for Athens–Gargalianoi line

Athens-Gargalianoi								
Departure	Day							Arrival
8:00	1	2	3	4	5	6	7	12:30
12:00	1	2	3	4	5	6	7	16:30
16:00	1	2	3	4	5	6	7	20:30
Gargalianoi-Athens								
	Day							Arrival
6:15	1	2	3	4	5	6	7	10:45
10:00	1	2	3	4	5	6	7	14:30
14:30	1	2	3	4	5	6	7	19:00

Table 208: Current KTEL schedule for Athens–Gargalianoi line

Above, the resulted schedules for the fully relaxed, 30 minute window (± 15 min), 60 minute window (± 30 min), 90 minute window (± 45 min) and 120 minute window (± 60 min) case of Messinia routes connected with Athens were presented. Additionally, the current schedule for every route was presented. What is more, as it was mentioned above, waiting time results tables for the aforementioned lines are grouped together as waiting time results between Athens and Messinia prefecture routes.

	Fully relaxed	± 15 min	± 30 min	± 45 min	± 60 min	Current
Total waiting time	53,197	117,833	113,246	102,941	96,516	134,182
Av. Waiting time	149	321	309	282	265	366
Feasible transition	2,856	3,383	3,365	3,378	3,358	3,344

Table 209: Results table between Athens and Messinia routes

	Fully relaxed	± 15 min	± 30 min	± 45 min	± 60 min	Current
Fully relaxed	0					

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± 15min	-1.215	0				
± 30min	-1.129	0.039	0			
± 45min	-0.935	0.126	0.091	0		
± 60min	-0.814	0.181	0.148	0.062	0	
Current	-1.522	-0.139	-0.185	-0.303	-0.390	0

Table 210: Percentage difference of total waiting time between code variations from Athens to Messinia destinations

In the above results of Messinia routes connecting Athens, a reduction up to 152.2% is observed. More precisely, the percentage of decrease is 13.9% between current and 30 minute window case, 18.5% between current and 60 minute window case, 30.3% between current and 90 minute window case, 39% between current and 120 minute window case and 152.2% between current and fully relaxed case. The last one is equal to a decrease of about 80,985 minutes from the current total waiting time and a reduction of 217 minutes in average waiting time respectively. This reduction leads to a value of total waiting time equal to 53,197 minutes in fully relaxed case. The same value in the current schedule is 134,182 minutes.

Departure time from Athens to Nafplio						
Day	Variation					
	fully relaxed	±15min	±30min	±45min	±60min	
Monday	5:16	6:00	5:45	5:30	5:16	
	6:31	7:45	7:30	7:15	7:00	
	7:46	9:43	9:43	9:43	9:43	
	9:43	10:45	10:43	10:43	10:43	
	10:58	12:39	12:39	12:39	12:39	
	12:39	13:45	13:39	13:39	13:39	
	14:24	15:39	15:39	15:39	14:39	
	15:39	16:39	16:39	16:39	15:39	
	16:54	17:45	17:39	17:39	16:39	
	18:09	18:45	18:39	18:39	17:39	
19:37	19:45	19:39	20:39	20:39		
20:39	21:15	21:00	21:39	22:26		
Tuesday	5:16	6:00	5:45	5:30	5:16	
	6:53	7:45	7:30	7:15	7:00	
	8:08	9:15	9:00	8:45	8:30	
	9:23	10:45	10:38	10:38	10:38	

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	10:38	12:39	12:39	12:39	12:39
	12:39	13:45	13:39	13:39	13:39
	14:24	15:39	15:39	15:39	14:39
	15:39	16:39	16:39	16:39	15:39
	16:54	17:45	17:39	17:39	16:39
	18:09	18:45	18:39	18:39	17:39
	19:24	19:45	19:39	20:39	20:39
	20:39	21:15	21:00	21:39	22:27
Wednesday	5:16	6:00	5:45	5:30	5:16
	6:53	7:45	7:30	7:15	7:00
	8:08	9:15	9:00	8:45	8:30
	9:23	10:45	10:38	10:38	10:38
	10:38	12:39	12:39	12:39	12:39
	12:39	13:45	13:39	13:39	13:39
	14:24	15:39	15:39	15:39	14:39
	15:39	16:39	16:39	16:39	15:39
	16:54	17:45	17:39	17:39	16:39
	18:09	18:45	18:39	18:39	17:39
	19:24	19:45	19:39	20:39	20:39
	20:39	21:15	21:00	21:39	22:27
Thursday	5:15	6:00	5:45	5:30	5:16
	6:53	7:45	7:30	7:15	7:00
	8:08	9:15	9:00	8:45	8:30
	9:23	10:45	10:38	10:38	10:38
	10:38	12:39	12:39	12:39	12:39
	12:39	13:45	13:39	13:39	13:39
	14:24	15:39	15:39	15:39	14:39
	15:39	16:39	16:39	16:39	15:39
	16:54	17:45	17:39	17:39	16:39
	18:09	18:45	18:39	18:39	17:39
	19:24	19:45	19:39	20:39	20:39
	20:39	21:15	21:00	21:39	22:27

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Friday	5:16	6:00	5:45	5:30	5:16
	6:31	7:45	7:30	7:15	7:00
	8:08	9:15	9:38	9:38	8:30
	9:23	10:38	10:38	10:38	9:30
	10:38	11:38	11:38	11:38	10:38
	12:39	12:39	12:39	12:39	11:38
	14:24	13:39	13:39	13:39	12:39
	15:39	14:39	14:39	14:39	13:39
	17:06	15:39	15:39	15:39	14:39
	18:21	16:39	16:39	16:39	15:39
	19:37	17:45	18:00	18:15	16:39
	20:51	18:45	19:00	19:15	19:30
	22:27	21:15	21:00	20:45	22:27
Saturday	5:16	7:15	7:00	6:45	6:30
	6:53	8:15	8:00	7:45	7:30
	8:08	9:37	9:38	9:38	8:30
	9:23	10:38	10:38	10:38	9:30
	10:38	11:38	11:38	11:38	10:38
	12:39	12:39	12:39	12:39	12:39
	14:24	13:45	13:39	13:39	13:39
	15:39	15:39	15:39	15:39	15:39
	16:54	16:45	16:39	16:39	16:39
	18:09	18:15	18:00	17:45	17:39
	19:24	19:45	19:30	20:39	20:39
20:39	21:15	21:00	21:39	22:27	
Sunday	5:16	7:15	7:00	6:45	6:30
	6:53	8:45	8:30	8:15	8:00
	8:08	10:38	10:38	10:37	10:38
	9:23	11:45	11:38	12:39	11:38
	10:38	13:15	13:00	13:39	12:39
	12:39	14:45	14:30	15:39	14:00
	13:54	16:15	16:00	16:39	15:39
	15:39	17:15	17:37	17:37	16:39

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	18:21	18:36	18:37	18:37	18:36
	19:37	19:37	19:37	19:37	19:37
	20:51	20:45	20:39	20:39	20:39
	22:27	22:14	22:00	21:45	21:39
Departure time from Nafplio to Athens					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	2:47	4:48	4:48	4:48	4:48
	4:02	5:48	5:48	5:48	5:48
	5:17	6:48	6:48	6:48	6:48
	6:32	7:48	7:48	7:48	7:48
	7:48	9:15	9:30	9:45	9:46
	9:17	10:15	10:30	10:45	10:46
	10:33	11:15	11:30	11:45	11:46
	11:48	12:45	12:46	12:46	12:46
	13:18	13:46	13:46	13:46	13:46
	14:33	15:15	15:30	14:48	14:48
	15:48	16:45	17:00	15:48	15:48
	19:15	17:45	18:00	18:15	18:30
	20:30	18:45	19:00	19:15	19:30
21:45	20:15	20:30	20:45	21:00	
Tuesday	3:27	5:45	5:48	4:48	4:48
	4:42	6:48	6:48	6:48	6:48
	5:57	7:48	7:48	7:48	7:48
	7:48	9:45	10:00	10:15	10:30
	10:33	11:15	11:30	11:45	11:46
	11:48	12:45	12:46	12:46	12:46
	13:18	13:46	13:46	13:46	13:46
	14:33	15:15	15:30	14:48	14:48
	15:48	16:45	17:00	15:48	15:48
	20:30	18:45	19:00	19:15	19:30
21:45	20:15	20:30	20:45	21:00	
Wednesday	3:27	5:45	5:48	4:48	4:48

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	4:42	6:48	6:48	6:48	6:48
	5:57	7:48	7:48	7:48	7:48
	7:48	9:45	10:00	10:15	10:30
	10:33	11:15	11:30	11:45	11:46
	11:48	12:45	12:46	12:46	12:46
	13:18	13:46	13:46	13:46	13:46
	14:33	15:15	15:30	14:48	14:48
	15:48	16:45	17:00	15:48	15:48
	20:30	18:45	19:00	19:15	19:30
	21:45	20:15	20:30	20:45	21:00
	3:27	5:45	5:48	4:48	4:48
	4:42	6:48	6:48	6:48	6:48
	5:57	7:48	7:48	7:48	7:48
	7:48	9:45	10:00	10:15	10:30
	10:33	11:15	11:30	11:45	11:46
Thursday	11:48	12:45	12:46	12:46	12:46
	13:18	13:46	13:46	13:46	13:46
	14:33	15:15	15:30	14:48	14:48
	15:48	16:45	17:00	15:48	15:48
	20:30	18:45	19:00	19:15	19:30
	21:45	20:15	20:30	20:45	21:00
	3:27	5:45	5:57	4:48	4:48
	4:42	6:48	7:30	6:48	6:48
	5:57	7:48	8:30	7:48	7:48
	7:33	9:45	10:00	8:48	8:48
	8:48	11:15	11:30	10:48	10:48
Friday	10:33	12:45	12:46	11:48	11:48
	11:48	14:46	13:46	13:46	13:46
	13:46	15:15	15:30	14:48	14:48
	15:32	16:45	16:47	15:48	15:48
	16:47	17:45	18:00	16:47	16:47
	20:30	18:45	19:00	19:15	19:30

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	21:45	20:15	20:30	20:45	21:00
Saturday	3:27	6:45	6:48	5:57	5:57
	4:42	7:48	7:48	7:48	7:48
	5:57	9:45	10:00	10:15	10:30
	7:48	11:15	11:30	11:45	11:46
	10:33	12:45	12:46	12:46	12:46
	11:48	13:46	13:46	13:46	13:46
	13:46	15:15	15:30	14:47	14:48
	15:48	16:45	17:00	15:48	15:48
	20:30	18:15	18:30	18:45	19:00
	21:45	20:15	20:30	20:45	21:00
Sunday	3:27	6:45	6:48	5:57	5:57
	4:42	7:48	7:48	7:48	7:48
	5:57	9:45	10:00	8:48	8:48
	7:33	11:15	11:30	10:48	10:48
	8:47	12:45	12:46	11:48	11:48
	10:33	13:46	13:46	13:46	13:46
	11:48	14:48	14:48	14:48	14:48
	13:46	15:48	15:48	15:48	15:48
	15:48	18:15	18:30	18:45	19:00
	20:30	19:15	19:30	19:45	20:00
21:45	20:45	21:00	21:15	21:25	

Table 211: Optimized KTEL schedule for Athens–Nafplio line

Athens-Nafplio								
Departure	Day							Arrival
6:15	1	2	3	4	5			8:30
7:30						6	7	9:45
8:00	1	2	3	4	5			10:15
8:30						6		10:45
9:00							7	11:15
9:30	1	2	3	4	5	6		11:45
10:30					5	6	7	12:45
11:00	1	2	3	4				13:15

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11:30					5	6		13:45
12:00							7	14:15
12:30	1	2	3	4	5	6		14:45
13:30					5		7	15:45
14:00	1	2	3	4		6		16:15
14:30					5			16:45
15:00							7	17:15
15:30	1	2	3	4	5	6		17:45
16:30	1	2	3	4	5		7	18:45
17:00						6		19:15
17:30	1	2	3	4	5		7	19:45
18:30	1	2	3	4	5	6	7	20:45
19:30							7	21:45
20:00	1	2	3	4		6		22:15
21:00							7	23:15
21:30	1	2	3	4	5	6		23:45
22:30							7	0:45
Nafplio-Athens								
Departure					Day			Arrival
5:00	1							7:15
5:30		2	3	4	5			7:45
6:00	1							8:15
6:30						6	7	8:45
7:00	1	2	3	4	5			9:15
8:00	1	2	3	4	5	6	7	10:15
9:00	1							11:15
9:30		2	3	4	5	6	7	11:45
10:00	1							12:15
11:00	1	2	3	4	5	6	7	13:15
12:30	1	2	3	4	5	6	7	14:45
14:00	1	2	3	4	5	6	7	16:15
15:00	1	2	3	4	5	6	7	17:15
16:00							7	18:15
16:30	1	2	3	4	5	6		18:45
17:30	1				5			19:45

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

18:00						6	7	20:15
18:30	1	2	3	4	5			20:45
19:00							7	21:15
20:00	1	2	3	4	5	6		22:15
20:30							7	22:45

Table 212: Current KTEL schedule for Athens–Nafplio line

Departure time from Athens to Kranidi					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	9:43	9:43	8:45	8:30
	6:31	10:45	10:43	10:38	10:38
	9:43	16:05	15:50	15:39	15:39
Tuesday	5:16	9:15	9:00	8:45	8:30
	6:31	10:45	10:38	10:38	10:38
	10:38	16:05	15:50	15:39	15:39
Wednesday	5:16	9:15	9:00	8:45	8:30
	6:31	10:45	10:38	10:38	10:38
	10:38	16:05	15:50	15:39	15:39
Thursday	5:16	9:15	9:00	8:45	8:30
	6:31	10:45	10:38	10:38	10:38
	10:38	16:05	15:50	15:39	15:39
Friday	5:16	9:15	9:00	8:45	8:30
	6:31	10:38	10:38	10:38	9:29
	7:46	11:38	11:38	11:38	10:38
	10:38	16:05	15:50	15:39	15:39
Saturday	5:16	9:15	9:00	8:45	8:30
	6:31	10:45	10:38	10:38	10:38
	10:38	16:05	15:50	15:39	15:39
Sunday	5:16	9:15	9:00	8:45	8:30
	6:31	16:05	15:50	15:39	15:39

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

Departure time from Kranidi to Athens					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	6:33	5:30	5:33	5:33	4:42
	10:33	6:30	6:33	6:33	6:33
	12:31	11:15	10:33	10:33	10:33
	14:33	14:33	14:33	14:33	14:33
	20:10	18:00	18:15	18:30	18:45
Tuesday	6:33	5:30	5:33	5:33	4:42
	10:33	6:30	6:33	6:33	6:33
	12:31	11:15	10:33	10:33	10:33
	14:33	14:33	14:33	14:33	14:33
	20:10	18:00	18:15	18:30	18:45
Wednesday	6:33	5:30	5:33	5:33	4:42
	10:33	6:30	6:33	6:33	6:33
	12:31	11:15	10:33	10:33	10:33
	14:33	14:33	14:33	14:33	14:33
	20:10	18:00	18:15	18:30	18:45
Thursday	6:33	5:30	5:33	5:33	4:42
	10:33	6:30	6:33	6:33	6:33
	12:31	11:15	10:33	10:33	10:33
	14:33	14:33	14:33	14:33	14:33
	20:10	18:00	18:15	18:30	18:45
Friday	7:33	5:30	5:33	5:33	4:42
	10:33	6:30	6:33	6:33	6:33
	12:31	11:15	10:33	10:33	10:33
	15:32	14:33	14:33	14:33	15:32
	20:10	18:00	18:15	18:30	18:45
Saturday	6:33	5:30	5:33	5:33	4:42
	10:33	6:30	6:33	6:33	6:33
	12:31	11:15	10:33	10:33	10:33
	14:33	14:33	14:33	14:33	14:33

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	20:10	18:00	18:15	18:30	18:45
Sunday	10:33	6:30	6:33	6:33	6:33
	12:31	11:15	10:33	10:33	10:33
	14:33	14:33	14:33	14:33	14:33
	20:10	18:00	18:15	18:30	18:45

Table 213: Optimized KTEL schedule for Athens–Kranidi line

Athens-Kranidi								
Departure	Day							Arrival
9:30	1	2	3	4	5	6	7	13:00
10:30					5			14:00
11:00	1	2	3	4		6		14:30
11:30					5			15:00
16:20	1	2	3	4	5	6	7	19:50
Kranidi-Athens								
Departure	Day							Arrival
5:30	1	2	3	4	5	6		9:00
6:15	1	2	3	4	5	6	7	9:45
11:00	1	2	3	4	5	6	7	14:30
14:45	1	2	3	4	5	6	7	18:15
17:45	1	2	3	4	5	6	7	21:00

Table 214: Current KTEL schedule for Athens–Kranidi line

Departure time from Athens to Galatas					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	5:16	16:05	15:50	15:39	15:39
Tuesday	5:16	16:05	15:50	15:39	15:39
Wednesday	5:16	16:05	15:50	15:39	15:39
Thursday	5:16	16:05	15:50	15:39	15:39
Friday	5:16	16:05	15:50	15:39	15:39
Saturday	5:16	16:05	15:50	15:39	15:39
Sunday	5:16	16:05	15:50	15:39	15:39
Departure time from Galatas to Athens					
Day	Variation				
	fully relaxed	±15min	±30min	±45min	±60min
Monday	7:03	6:00	6:15	5:12	5:12

CHAPTER 5: DEPARTURE AND WAITING TIME RESULTS

	11:03	11:03	11:03	11:03	11:03
	13:01	18:00	18:15	18:30	18:45
Tuesday	5:12	6:00	6:15	5:12	5:12
	7:03	11:03	11:03	11:03	11:03
	11:03	18:00	18:15	18:30	18:45
Wednesday	4:03	6:00	6:15	5:12	5:12
	11:03	11:03	11:03	11:03	11:03
	13:01	18:00	18:15	18:30	18:45
Thursday	4:03	6:00	6:15	5:12	5:12
	7:03	11:03	11:03	11:03	11:03
	11:03	18:00	18:15	18:30	18:45
Friday	4:03	6:00	6:15	5:12	5:12
	8:03	11:03	11:03	11:03	11:03
	11:03	18:00	18:15	18:30	18:45
Saturday	4:03	11:03	11:03	11:03	11:03
Sunday	5:12	18:00	18:15	18:30	18:45

Table 215: Optimized KTEL schedule for Athens–Galatas line

Athens–Galatas								
Departure	Day							Arrival
16:20	1	2	3	4	5	6	7	19:20
Galatas–Athens								
Departure	Day							Arrival
5:45	1	2	3	4	5			8:45
11:10	1	2	3	4	5	6		14:10
17:45	1	2	3	4	5		7	20:45

Table 216: Current KTEL schedule for Athens–Galatas line

Above, the resulted schedules for the fully relaxed, 30 minute window (± 15 min), 60 minute window (± 30 min), 90 minute window (± 45 min) and 120 minute window (± 60 min) case of Argolida routes connected with Athens were presented. Additionally, the current schedule for every route was presented. What is more, as it was mentioned above, waiting time results tables for the aforementioned lines are grouped together as waiting time results between Athens and Argolida prefecture routes.

	Fully relaxed	± 15min	± 30min	± 45min	± 60min	Current
Total waiting time	26,726	61,004	57,659	53,600	49,568	70,550
Av. Waiting time	100	221	209	196	182	255
Feasible transition	2,568	3,097	3,077	3,095	3,066	3,054

Table 217: Results table between Athens and Argolida routes

	Fully relaxed	± 15min	± 30min	± 45min	± 60min	Current
Fully relaxed	0					
± 15min	-1.283	0				
± 30min	-1.157	0.055	0			
± 45min	-1.006	0.121	0.070	0		
± 60min	-0.855	0.187	0.140	0.075	0	
Current	-1.640	-0.156	-0.224	-0.316	-0.423	0

Table 218: Percentage difference of total waiting time between code variations from Athens to Argolida destinations

In the above results of Argolida routes connecting Athens, a reduction up to 164% is observed. More precisely, the percentage of decrease is 15.6% between current and 30 minute window case, 22.4% between current and 60 minute window case, 31.6% between current and 90 minute window case, 42.3% between current and 120 minute window case and 164% between current and fully relaxed case. The last one is equal to a decrease of about 43,824 minutes from the current total waiting time and a reduction of 155 minutes in average waiting time respectively. The reduction in waiting time is not as great as in other occasions above, but still total waiting time value is decreased from 70,550 to 26,726 minutes and average waiting time from 255 to 100 minutes respectively (The aforementioned values exist in the results table in current and fully relaxed column respectively).

6. CONCLUSION

To sum up, TRAINOSE railway network was presented (nodes and connections) as well as KTEL Intercity Bus Network (nodes, connections and timetables). The timetables of transport operators are synchronized to improve co-modality. The bus schedule was first kept unchanged and treated as data. A mathematical model was developed, the purpose of which was to minimize the total waiting time for the first available transition when exchanging means of transport. Then, bus synchronization was occurred, where bus schedule was synchronized with some routes of its schedule remaining constant or with train routes kept unchanged.

After carefully studying the results, certain observations were made in train synchronization. Firstly, as the relaxation gets higher (10 – 90 minute window), it is observed that the departure time may vary for different days. The current train schedule is exactly the same for every day of the week (Monday to Sunday). This is an expected and desired result, since the KTEL schedule is different for each day in almost every line. The fact that the optimized train schedule is slightly different for each day shows that the KTEL schedule was taken into consideration for the synchronization, as it should have been.

Secondly, the relaxation also leads to significant reduction of the total waiting time, in each line, proving that the model serves its purpose.

One may notice that the number of feasible transitions often is decreased in the optimal timetable. This is not a negative result because the feasible transitions may be less but they are all more convenient and time saving than the current ones, resulting to a reduced average waiting time.

What is more, observations were made in KTEL synchronization, too. In this synchronization, due to different relaxation criteria, there are some changes in comparison with train synchronization results. More precisely, taking into consideration the results of the fully relaxed model, it is observed that there is an optimized timetable where waiting time is significantly reduced comparing to the current one. This is occurred because of the absence of bounds while synchronizing departure time. In contrast, time window code versions (30 minute, 60 minute etc.) set bounds in relation to the current departure time. The only constraint set in fully relaxed version is a lower and upper time limit for every day-the time out of limit is that time when KTEL routes are not executed (late night)- and a gap that is equal to the greatest and

CHAPTER 6: CONCLUSION

the least time difference between two sequential routes of current timetable. Therefore, the results are significantly improved but still in some cases, the efficient ones may be obtained from a time-window constraint version. This is occurred because neither passengers' needs nor KTEL transit authority requirements are taken into consideration.

All in all, the synchronization of TRAINOSE and KTEL schedule is feasible. The total waiting time for a transition between suburban bus and scheduled train route is reduced by an average of 12.2% up to 31% depending on the code case and the chosen relaxation (the aforementioned amounts are referred to the 1st case or ± 5 min and the 3rd case or ± 45 min respectively of Patra – Rio suburban line). The total waiting time for a transition between KTEL routes is reduced up to 115% (between current timetable fully relaxed timetable in Korinthia routes) and the total waiting time for a transition between KTEL synchronized route and train constant route is reduced up to 1512.3% (between current timetable and fully relaxed timetable in Patra destinations, Pyrgos Route). Despite the fact that in the aforementioned case the reduction was too high, the resulted tables from all this procedure can be further analyzed and a new timetable can be set, taking into consideration passengers' needs as well as the requirements of every KTEL station.

7. APPENDIX

Appendix A: Current departure time tables

All data tables referred throughout this document are cited below (tables 219 to 235). We first start with Athens destinations (table 219 below)

ATHENS-NAFPLIO							NAFPLIO-ATHENS									
Departure	Day						Arrival	Departure	Day						Arrival	
6:15	1	2	3	4	5		8:30	5:00	1						7:15	
7:30						6	7	9:45	5:30	2	3	4	5		7:45	
8:00	1	2	3	4	5		10:15	6:00	1						8:15	
8:30						6	10:45	6:30				6	7	8:45		
9:00						7	11:15	7:00	1	2	3	4	5	9:15		
9:30	1	2	3	4	5	6	11:45	8:00	1	2	3	4	5	6	7	10:15
10:30					5	6	7	12:45	9:00	1					11:15	
11:00	1	2	3	4			13:15	9:30	2	3	4	5	6	7	11:45	
11:30					5	6	13:45	10:00	1						12:15	
12:00						7	14:15	11:00	1	2	3	4	5	6	7	13:15
12:30	1	2	3	4	5	6	14:45	12:30	1	2	3	4	5	6	7	14:45
13:30					5	7	15:45	14:00	1	2	3	4	5	6	7	16:15
14:00	1	2	3	4		6	16:15	15:00	1	2	3	4	5	6	7	17:15
14:30					5		16:45	16:00						7	18:15	
15:00						7	17:15	16:30	1	2	3	4	5	6	18:45	
15:30	1	2	3	4	5	6	17:45	17:30	1			5			19:45	
16:30	1	2	3	4	5	7	18:45	18:00					6	7	20:15	
17:00						6	19:15	18:30	1	2	3	4	5		20:45	
17:30	1	2	3	4	5	7	19:45	19:00						7	21:15	
18:30	1	2	3	4	5	6	7	20:45	20:00	1	2	3	4	5	6	22:15
19:30						7	21:45	20:30						7	22:45	
20:00	1	2	3	4		6	22:15									
21:00						7	23:15									
21:30	1	2	3	4	5	6	23:45									
22:30						7	0:45									

ATHENS-							KRANIDI-						
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KRANIDI								ATHENS									
Departure	Day							Arrival	Departure	Day							Arrival
9:30	1	2	3	4	5	6	7	13:00	5:30	1	2	3	4	5	6	9:00	
10:30					5			14:00	6:15	1	2	3	4	5	6	7	9:45
11:00	1	2	3	4		6		14:30	11:00	1	2	3	4	5	6	7	14:30
11:30					5			14:45	14:45	1	2	3	4	5	6	7	18:15
16:20	1	2	3	4	5	6	7	19:50	17:45	1	2	3	4	5	6	7	21:00

ATHENS-GALATAS								GALATAS-ATHENS									
Departure	Day							Arrival	Departure	Day							Arrival
16:20	1	2	3	4	5	6	7	19:20	5:45	1	2	3	4	5	8:45		
								11:10	11:10	1	2	3	4	5	6	14:10	
								17:45	17:45	1	2	3	4	5	7	20:45	

ATHENS-SPARTI								SPARTI-ATHENS									
Departure	Day							Arrival	Departure	Day							Arrival
6:30	1	2	3	4	5	6	7	10:00	6:00	1	2	3	4	5	6	9:30	
8:30	1	2	3	4	5	6	7	12:00	7:00	1	2	3	4	5	6	10:30	
10:30	1	2	3	4	5	6	7	14:00	8:30	1	2	3	4	5	6	7	12:00
13:15	1	2	3	4	5	6	7	16:45	10:15	1	2	3	4	5	6	7	13:45
14:15	1	2	3	4	5	6	7	17:45	10:30	1	2	3	4	5	6	7	14:00
16:15	1	2	3	4	5	6	7	19:45	13:15	1	2	3	4	5	6	7	16:45
17:15	1	2	3	4	5	6	7	20:45	15:00	1	2	3	4	5	6	7	18:30
18:15	1	2	3	4	5	6	7	21:45	17:00	1	2	3	4	5	6	7	20:30
20:15	1	2	3	4	5	6	7	23:45	20:00	1	2	3	4	5	6	7	23:30

ATHENS-NEAPOLI								NEAPOLI-ATHENS									
Departure	Day							Arrival	Departure	Day							Arrival
6:30	1	2	3	4	5	6	7	12:30	7:15	1	2	3	4	5	6	7	13:15
13:15	1	2	3	4	5	6	7	19:15	14:00	1	2	3	4	5	6	7	20:00
16:15	1	2	3	4	5	6	7	22:15	17:15	1	2	3	4	5	6	7	23:15

ATHENS-MOLAOI								MOLAOI-ATHENS									
Departure	Day							Arrival	Departure	Day							Arrival

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6:30	1	2	3	4	5	6	7	11:30	5:15	1	2	3	4	5			10:15
8:30	1	2	3	4	5	6	7	13:30	6:30	1	2	3	4	5	6	7	11:30
10:30	1	2	3	4	5			15:30	8:15	1	2	3	4	5	6	7	13:15
13:15	1	2	3	4	5	6	7	18:15	8:45						6	7	13:45
16:15	1	2	3	4	5	6	7	21:15	15:00	1	2	3	4	5		7	20:00
17:15	1	2	3	4	5	6	7	22:15	18:00	1	2	3	4	5	6	7	23:00

ATHENS-AREOPOLI									AREOPOLI-ATHENS								
Departure	Day							Arrival	Departure	Day							Arrival
6:30	1	2	3	4	5	6	7	12:30	8:30	1	2	3	4	5	6	7	14:30
8:30	1	2	3	4	5	6	7	14:30	15:15	1	2	3	4	5	6	7	21:15
14:15	1	2	3	4	5	6	7	20:15	18:00	1	2	3	4	5	6	7	0:00

ATHENS-GYTHIO									GYTHIO-ATHENS								
Departure	Day							Arrival	Departure	Day							Arrival
6:30	1	2	3	4	5	6	7	11:00	7:30	1	2	3	4	5	6	7	12:00
8:30	1	2	3	4	5	6	7	13:00	9:15	1	2	3	4	5	6	7	13:45
10:30	1	2	3	4	5	6	7	15:00	12:00	1	2	3	4	5	6	7	16:30
14:15	1	2	3	4	5	6	7	18:45	14:00	1	2	3	4	5	6	7	18:30
18:15	1	2	3	4	5	6	7	22:45	16:00	1	2	3	4	5	6	7	20:30
									19:00	1	2	3	4	5	6	7	23:30

ATHENS-KEEM									KEEM-ATHENS								
Departure	Day							Arrival	Departure	Day							Arrival
6:30	1	2	3	4	5	6	7	10:15	7:45	1	2	3	4	5	6	7	11:30
8:30	1	2	3	4	5	6	7	12:15	9:15	1	2	3	4	5	6	7	13:00
10:30	1	2	3	4	5	6	7	14:15	10:15	1	2	3	4	5	6	7	14:00
13:15	1	2	3	4	5	6	7	17:00	12:20	1	2	3	4	5	6	7	16:05
14:15	1	2	3	4	5	6	7	18:00	14:10	1	2	3	4	5	6	7	17:55
16:15	1	2	3	4	5	6	7	20:00	16:20	1	2	3	4	5	6	7	20:05
17:15	1	2	3	4	5	6	7	21:00	19:20	1	2	3	4	5	6	7	23:05
18:15	1	2	3	4	5	6	7	22:00									

ATHENS-MONEMVASIA									MONEMVASIA-ATHENS								
Departure	Day							Arrival	Departure	Day							Arrival

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6:30	1	2	3	4	5	6	7	12:00	4:45	1	2	3	4	5	6	10:15	
8:30	1	2	3	4	5	6		14:00	7:15	1	2	3	4	5	6	7	12:45
10:30	1	2	3	4	5	6	7	16:00	14:15	1	2	3	4	5	6	7	19:45
17:15	1	2	3	4	5	6	7	22:45	17:30	1	2	3	4	5	6	7	23:00

ATHENS-GEROLIMENAS									GEROLIMENA S-ATHENS								
								Arrival									Arrival
Departure	Day								Departure	Day							
6:30	1	2	3	4	5	6	7	13:00	6:45	1	2	3	4	5	6	7	13:15
8:30	1	2	3	4	5	6	7	15:00	14:30	1	2	3	4	5	6	7	21:00
14:15	1	2	3	4	5	6	7	20:45	17:00	1	2	3	4	5	6	7	23:30

ATHENS-KALAMATA									KALAMATA-ATHENS								
								Arrival									Arrival
Departure	Day								Departure	Day							
6:15	1	2	3	4	5	6		9:30	4:45	1	2	3	4	5	6		8:00
7:30	1	2	3	4	5	6	7	10:45	6:30	1	2	3	4	5	6	7	9:45
9:00	1	2	3	4	5	6	7	12:15	8:00	1	2	3	4	5	6	7	11:15
10:30	1	2	3	4	5	6	7	13:45	9:30	1	2	3	4	5	6	7	12:45
11:45	1	2	3	4	5	6	7	15:00	10:30	1	2	3	4	5	6	7	13:45
13:00	1	2	3	4	5	6	7	16:15	12:00	1	2	3	4	5	6	7	15:15
14:15	1	2	3	4	5	6	7	17:30	13:30	1	2	3	4	5	6	7	16:45
15:30	1	2	3	4	5	6	7	18:45	15:00	1	2	3	4	5	6	7	18:15
16:30	1	2	3	4	5	6	7	19:45	16:30	1	2	3	4	5	6	7	19:45
18:00	1	2	3	4	5	6	7	21:15	18:00	1	2	3	4	5		7	21:15
19:30	1	2	3	4	5	6	7	22:45	19:30	1	2	3	4	5	6	7	22:45
21:30	1	2	3	4	5	6	7	0:45	21:45	1	2	3	4	5	6	7	1:00

ATHENS-MESSINI									MESSINI-ATHENS								
								Arrival									Arrival
Departure	Day								Departure	Day							
9:30	1	2	3	4	5	6	7	13:30	8:30	1	2	3	4	5	6	7	12:30

ATHENS-PYLOS									PYLOS-ATHENS								
								Arrival									Arrival
Departure	Day								Departure	Day							
9:30	1	2	3	4	5	6	7	14:15	9:00	1	2	3	4	5	6	7	13:45
15:30	1	2	3	4	5	6	7	20:15									

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ATHENS-KORONI								KORONI-ATHENS									
Departure	Day							Arrival	Departure	Day							Arrival
7:30	1	2	3	4	5	6	7	12:15	7:55	1	2	3	4	5	6	7	12:40

ATHENS-GARGALIANI								GARGALIANI-ATHENS									
Departure	Day							Arrival	Departure	Day							Arrival
8:00	1	2	3	4	5	6	7	12:30	6:15	1	2	3	4	5	6	7	10:45
12:00	1	2	3	4	5	6	7	16:30	10:00	1	2	3	4	5	6	7	14:30
16:00	1	2	3	4	5	6	7	20:30	14:30	1	2	3	4	5	6	7	19:00
20:00	1	2	3	4	5	6	7	0:30	16:00						7	20:30	
									18:00	1	2	3	4	5	6	7	22:30

ATHENS-TRIPOLI								TRIPOLI-ATHENS									
Departure	Day							Arrival	Departure	Day							Arrival
5:50	1	2	3	4	5			8:05	5:00	1	2	3	4	5			7:15
7:30						6	7	9:45	6:45	1	2	3	4	5	6	7	9:00
8:00	1	2	3	4	5			10:15	8:30	1	2	3	4	5	6	7	10:45
9:30	1	2	3	4	5	6	7	11:45	9:30	1	2	3	4	5	6	7	11:45
11:00	1	2	3	4	5	6	7	13:15	11:00	1	2	3	4	5	6	7	13:15
12:30	1	2	3	4	5	6	7	14:45	12:15	1	2	3	4	5	6	7	14:45
14:00	1	2	3	4	5	6	7	16:15	13:45	1	2	3	4	5	6	7	16:00
15:00	1	2	3	4	5	6	7	17:15	15:00	1	2	3	4	5	6	7	17:15
16:00	1	2	3	4	5	6	7	18:15	16:30	1	2	3	4	5	6	7	18:45
17:00	1	2	3	4	5	6	7	19:15	17:00					5	7	19:15	
17:30					5			19:45	17:30	1	2	3	4	5	6	7	19:45
18:00					5	7		20:15	19:00	1	2	3	4	5	6	7	21:15
18:30	1	2	3	4		6		20:45	20:00						7	22:15	
19:00					5	7		21:15	21:30	1	2	3	4	5	6	7	23:45
20:15	1	2	3	4	5	6	7	22:30									
22:00	1	2	3	4	5	6	7	0:15									
23:00						7		1:15									

ATHENS-MEGALOPOLI								MEGALOPOLI-ATHENS									
Departure	Day							Arrival	Departure	Day							Arrival

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										al										
5:50	1	2	3	4	5					9:05	5:45	1	2	3	4	5	6	7	9:00	
7:30						6	7			10:45	7:15	1	2	3	4	5	6	7	10:30	
8:00	1	2	3	4	5					11:15	8:30	1	2	3	4	5	6	7	11:45	
9:30	1	2	3	4	5	6	7			12:45	10:00	1	2	3	4	5	6	7	13:15	
11:00	1	2	3	4	5					14:15	12:50	1	2	3	4	5	6	7	16:05	
12:30	1	2	3	4	5	6	7			15:45	14:00	1	2	3	4	5	6	7	17:15	
15:00	1	2	3	4	5	6	7			18:15	15:30							7	18:45	
17:00	1	2	3	4	5	6	7			20:15	16:30	1	2	3	4	5	6		19:45	
20:15	1	2	3	4	5	6	7			23:30	17:00							7	20:15	
											18:00	1	2	3	4	5	6		21:15	
											19:30							7	22:45	
											20:30	1	2	3	4	5	6		23:45	

ATHENS-LEONIDIO										LEONIDIO-ATHENS											
										Arriv											Arrival
Departure	Day									al	Departure	Day									Arrival
8:15	1	2	3	4	5	6	7			12:15	5:30	1	2	3	4	5	6			9:30	
16:00	1	2	3	4	5	6	7			20:00	8:15	1	2	3	4	5	6	7		12:15	
18:30					5					22:30	16:30	1	2	3	4	5	6	7		20:30	

ATHENS-ANDRITSENA										ANDRITSENA-ATHENS											
										Arriv											Arrival
Departure	Day									al	Departure	Day									Arrival
9:30					5					13:15	8:00	1					6			11:45	
17:00					5		7			20:45	11:45					5				15:30	
											14:45	2	3	4				7		18:30	

ATHENS-PYRGOS										PYRGOS-ATHENS											
										Arriv											Arrival
Departure	Day									al	Departure	Day									Arrival
7:00	1	2	3	4	5					11:45	5:00	1	2	3	4	5	6			9:45	
7:30						6	7			11:30	7:30	1	2	3	4	5	6	7		12:15	
8:00	1	2	3	4	5					12:45	7:35	1	2	3	4	5	6			12:20	
9:00						6				13:45	9:30	1	2	3	4	5	6	7		12:30	
11:00							7			15:45	10:00	1	2	3	4	5	6	7		14:45	
13:00	1	2	3	4	5	6				17:45	12:30	1	2	3	4	5	6	7		17:15	
14:30					5	6	7			18:30	14:30	1	2	3	4	5	6	7		18:30	
15:00	1	2	3	4						19:45	15:30	1	2	3	4	5	6	7		20:15	
16:00					5	6				20:45	17:15	1	2	3	4	5	6	7		21:15	
17:15							7			21:15	19:00	1	2	3	4	5	6	7		23:45	

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19:00	1	2	3	4	5	6	23:45	0:30	1	2	3	4	5	6	7	5:15
22:00					5	7	2:45									

ATHENS-MESOLOGGI								MESOLOGGI-ATHENS									
Departure	Day							Arrival	Departure	Day							Arrival
6:30	1	2	3	4	5	6	9:30	4:20	1	2	3	4	5	6	7:20		
7:30	1	2	3	4	5	6	7	10:30	6:30	1	2	3	4	5	6	7	9:30
9:00	1	2	3	4	5	6	7	12:00	9:20	1	2	3	4	5	6	7	12:20
11:00	1	2	3	4	5	6	7	14:00	10:20	1	2	3	4	5	6	7	13:20
14:00	1	2	3	4	5	6	7	17:00	11:30	1	2	3	4	5	6	7	14:30
14:45	1	2	3	4	5	6	7	17:45	13:30	1	2	3	4	5	6	7	16:30
17:00	1	2	3	4	5	6	7	20:00	14:15	1	2	3	4	5	6	7	17:15
19:30	1	2	3	4	5	6	7	22:30	16:45	1	2	3	4	5	6	7	19:45
21:30	1	2	3	4	5	6	7	0:30	18:30	1	2	3	4	5	6	7	21:30
									21:00	1	2	3	4	5	6	7	0:00

Table 219: Departures from Athens

Below, Larissa destinations current departure time is presented (table 220).

LARISSA-AGIA							AGIA-LARISSA									
Departure	Day						Arrival	Departure	Day						Arrival	
5:30	1	2	3	4	5	6:20	6:30	1	2	3	4	5	7:20			
6:00					6	6:50	8:00	1	2	3	4	5	8:50			
7:00					7	7:50	8:45	1	2	3	4	5	6	9:35		
7:30	1	2	3	4	5	8:20	9:00					7	9:50			
8:30	1	2	3	4	5	6	9:20	9:30	1	2	3	4	5	6	10:20	
9:00					7	9:50	10:30	1	2	3	4	5	11:20			
9:30	1	2	3	4	5	6	10:20	11:00					7	11:50		
11:00	1	2	3	4	5	11:50	11:15					6	12:05			
12:00	1	2	3	4	5	6	7	12:50	12:00	1	2	3	4	5	12:50	
12:45	1	2	3	4	5	6	13:35	13:30	1	2	3	4	5	6	7	14:20
13:30	1	2	3	4	5	6	7	14:20	14:30	1	2	3	4	5	6	15:20
14:30	1	2	3	4	5	6	15:20	16:00	1	2	3	4	5	16:50		
16:00	1	2	3	4	5	16:50	17:00					6	7	17:50		
17:00					6	7	17:50	17:30	1	2	3	4	5	18:20		
17:30	1	2	3	4	5	18:20	18:30	1	2	3	4	5	6	19:20		
19:00	1	2	3	4	5	19:50	19:00					7	19:50			
21:00		2		4		6	7	21:50	19:45	1	2	3	4	5	20:35	
21:30	1		3		5	22:20	21:45			2		4		6	7	22:35
								22:15	1		3		5	23:05		

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LARISSA-VELIKA						VELIKA-LARISSA								
Departure	Day					Arri val	Departure	Day					Arri val	
5:30	1	3	4	5		6:45	6:40	1	2	3	4	5	7:55	
6:00					6	7:15	7:15					6	8:30	
7:00					7	8:15	8:15					7	9:30	
13:30	1	3	4	5	6	7	14:45	16:00				6	7	17:15
								16:30	1	2	3	4	5	17:45
LARISSA-FARSALA						FARSALA-LARISSA								
Departure	Day					Arri val	Departure	Day					Arri val	
5:15	1	3	4	5		6:15	6:15	1	2	3	4	5	7:15	
6:00	1	3	4	5		7:00	7:00	1	2	3	4	5	8:00	
7:00	1	3	4	5	6	8:00	8:00	1	2	3	4	5	6	9:00
8:00					7	9:00	9:00	1	2	3	4	5	7	10:00
9:00	1	3	4	5	6	10:00	10:00					6	11:00	
10:00					7	11:00	11:00	1	2	3	4	5	7	12:00
11:00	1	3	4	5	6	12:00	12:00					6	13:00	
12:00	1	3	4	5	7	13:00	13:00	1	2	3	4	5	14:00	
13:30					6	14:30	13:30					7	14:30	
13:35	1	3	4	5		14:35	14:30					6	15:30	
15:00	1	3	4	5	6	7	16:00	15:00	1	2	3	4	5	16:00
17:00	1	3	4	5	6	7	18:00	16:30				6	7	17:30
19:15	1	3	4	5		20:15	17:00	1	2	3	4	5	18:00	
19:30					6	7	20:30	18:30				6	7	19:30
20:30			4				21:30	19:30	1	2	3	4	5	20:30
21:00	1	3	5			22:00	20:30					6	7	21:30
								21:30		2	4			22:30
								22:00	1	3	5			23:00
LARISSA-GONNOI						GONNOI-LARISSA								
Departure	Day					Arri val	Departure	Day					Arri val	
5:15	1	3	4	5		5:45	5:45	1	2	3	4	5	6:30	
6:00	1	3	4	5		6:30	6:40	1	2	3	4	5	7:10	
7:15	1	3	4	5		7:45	8:00	1	2	3	4	5	8:30	
7:30					6	8:15	8:30	1	2	3	4	5	6	9:00
8:00					7	8:45	9:00					7	9:30	
10:00	1	3	4	5	6	10:45	10:45	1	2	3	4	5	6	11:30

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12:00				6	7	12:30	13:00					6	7	13:45	
12:30	1	3	4	5		13:00	14:00	1	2	3	4	5		14:30	
14:00	1	3	4	5	6	14:30	16:00	1	2	3	4	5		16:30	
15:30	1	3	4	5	6	7	16:15	16:15					6	17:00	
18:00	1	3	4	5	6	18:30	17:00	1	2	3	4	5	6	7	17:30
18:30					7	19:00	19:00	1	2	3	4	5	6	19:45	
21:00			4		6	7	21:30	21:30		2		4	6	7	22:15
21:30	1	3		5		22:00	22:00	1		3		5		22:45	
LARISSA-AMPELAKIA						AMPELAKIA-LARISSA									
Departure	Day				Arri val	Departure	Day				Arri val				
6:00	1	3	4	5	6	7	6:45	1	2	3	4	5	6	7	7:30
12:30	1	3	4	5	6	7	13:15	1	2	3	4	5	6	7	14:00
LARISSA-KALLIPEFKI						KALLIPEFKI-LARISSA									
Departure	Day				Arri val	Departure	Day				Arri val				
6:00	1	3	4	5		7:10	7:10	1	2	3	4	5		8:20	
14:00	1	3	4	5		15:10	15:10	1	2	3	4	5		16:20	
LARISSA-PARAPOTAMOS						PARAPOTAMOS-LARISSA									
Departure	Day				Arri val	Departure	Day				Arri val				
6:00	1	3	4	5	6	7	6:25	1	2	3	4	5	6	7	6:50
7:15	1	3	4	5	6	7	7:50	1	2	3	4	5	6	7	8:15
12:30	1	3	4	5	6	7	12:55	1	2	3	4	5	6	7	13:20
LARISSA-SYKOURIO						SYKOURIO-LARISSA									
Departure	Day				Arri val	Departure	Day				Arri val				
5:30	1	3	4	5		5:50	6:00	1	2	3	4	5		6:20	
6:15	1	3	4	5		6:35	6:50	1	2	3	4	5		7:10	
6:30	1	3	4	5	6	6:50	7:30						6	7:50	
7:30	1	3	4	5		7:50	8:00	1	2	3	4	5		8:20	
8:15					7	8:35	8:15	1	2	3	4	5		8:35	
8:45					6	9:05	9:00						7	9:20	
9:00	1	3	4			9:20	9:30	1	2	3	4	5	6	9:50	
9:30	1	3	4	5		9:50	10:15	1	2	3	4	5		10:35	

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11:15	1	3	4	5	6	11:35	12:00	1	2	3	4	5	6	12:20		
12:00						7	12:20	13:15	1	2	3	4	5	13:35		
12:30	1	3	4	5		12:50	14:00	1	2	3	4	5	6	14:25		
13:00	1	3	4	5	6	13:20	14:10	1	2	3	4	5		14:30		
13:45	1	3	4	5		14:05	14:45	1	2	3	4	5		15:05		
14:30	1	3	4	5	6	14:50	15:15	1	2	3	4	5		15:35		
15:30	1	3	4	5	6	7	15:50	15:30					6	15:50		
17:00	1	3		5		17:20	16:15						7	17:05		
18:00	1	3	4	5		18:20	16:30		2		4			16:50		
19:30	1	3		5	6	7	19:50	17:00					6	17:20		
21:00			4			21:20	17:15	1		3		5		17:35		
21:30	1	3		5		21:50	18:00	1		3		5		18:20		
							18:45		2		4			19:05		
							20:15	1		3		5		20:35		
							20:30						6	7	20:50	
							21:45		2		4				22:05	
							22:15	1		3		5			22:35	
LARISSA-ELASSONA						ELASSONA-LARISSA										
Departure	Day				Arri	Departure	Da				Arri					
					val									val		
6:45	1	3	4	5	8:00	6:00	1	2	3	4	5			7:15		
7:15					6	7	8:30	7:30	1	2	3	4	5	6	7	8:30
9:00	1	3	4	5	10:00	8:15	1	2	3	4	5			9:15		
9:15					6	10:15	8:30						6	7	9:30	
9:30					7	10:30	9:00	1	2	3	4	5		10:00		
11:00	1	3	4	5	6	12:00	9:15	1		3		5		10:15		
12:00					6	7	13:15	10:00	1	2	3	4	5	6	11:00	
12:30	1	3	4	5		13:45	10:30							7	11:30	
13:00	1	3	4	5	6	7	14:00	10:45	1	2	3	4	5		12:00	
14:00	1	3		5	6	15:15	11:45							6	7	12:45
14:30	1	3	4	5		7	15:30	13:00	1	2	3	4	5		14:15	
15:30	1	3	4	5		16:30	13:30							6	14:45	
16:00				5	6	7	17:00	14:00	1	2	3	4	5		15:15	
18:00	1	3	4	5	6	19:00	15:45	1	2	3	4	5	6	7	16:45	
19:30	1	3	4	5		7	20:45	17:00	1	2	3	4	5	6	7	18:00
20:30	1	3	4	5		21:30	19:00	1	2	3	4	5	6	7	20:00	
21:00			4		6	7	22:15	21:00	1	2	3	4	5	6	7	22:00
21:30	1	3		5		22:15										
LARISSA-KRANIA						KRANIA-LARISSA										
Departure	Day				Arri	Departure	Da				Arri					

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11:00	3			val	12:30	12:30		y	3		val	14:00				
LARISSA-DESKATI					DESKATI-LARISSA											
Departure	Day			Arri val	Departure			Da y			Arri val					
11:00				6	13:00	13:00					6	15:00				
13:00			5	6	7	15:00	15:00			5	6	7	17:00			
15:30			5		17:30	17:30				5		18:30				
16:00			5	6	18:00	18:00				5	6	20:00				
LARISSA-PLATYLAMPOS					PLATYKAMPOS-LARISSA											
Departure	Day			Arri val	Departure			Da y			Arri val					
5:45	1	3	4	5	6:20	6:20	1	2	3	4	5	6:55				
6:50	1	3	4	5	7:20	7:20	1	2	3	4	5	7:50				
7:00				6	7:35	7:35					6	8:10				
9:00	1	3	4	5	6	9:35	9:35	1	2	3	4	5	6	10:10		
9:30				7	10:05	10:05					7	10:40				
11:00	1	3	4	5	6	11:30	11:30	1	2	3	4	5	6	12:00		
12:00	1	3		5		12:30	12:30	1		3		5		13:00		
13:00	1	3	4	5	6	7	13:30	13:30	1	2	3	4	5	6	7	14:00
13:15	1	3	4	5			13:50	13:50	1	2	3	4	5			14:25
14:30	1	3	4	5	6		15:00	15:00	1	2	3	4	5	6		15:30
16:00	1	3	4	5			16:35	16:35	1	2	3	4	5			17:10
18:00	1	3	4	5			18:30	18:30	1	2	3	4	5			19:00
19:15	1	3		5			19:50	19:50	1		3		5			20:25
21:00			4		6	7	21:35	21:35		2		4		6	7	22:10
21:30	1	3		5			22:05	22:05	1		3		5			22:40
LARISSA-N.PERIBOLI/AR MENIO					N.PERIBOLI/AR MENIO-LARISSA											
Departure	Day			Arri val	Departure			Da y			Arri val					
6:40	1			5	7:25	7:25	1				5	8:10				
13:00	1			5	13:45	13:45	1				5	14:30				
LARISSA-NAMATA/GLAFKI					NAMATA/GLAFKI-LARISSA											

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Departure	Day	Arri val	Departure	Da y	Arri val
7:20	1	5	8:00	1	5
13:15	1	5	13:55	1	5
LARISSA-AMPELONAS			AMPELONAS-LARISSA		
Departure	Day	Arri val	Departure	Da y	Arri val
5:50	1	3 4 5	6:20	1	2 3 4 5 6 7
6:00		6	6:30	1	2 3 4 5
6:35	1	3 4 5	7:05		6 7
7:00		6 7	7:30	1	2 3 4 5
7:50	1	3 4 5	8:20		6
8:00		6	8:30	1	2 3 4 5
9:00	1	3 4 5 6 7	9:00	1	2 3 4 5 6 7
10:00	1	3 4 5 6	9:30	1	2 3 4 5 6
11:00	1	3 4 5 6 7	10:30	1	2 3 4 5 6
12:00	1	3 4 5 6	10:30		6
13:00	1	3 4 5	11:20	1	2 3 4 5 7
13:30	1	3 4 5 6 7	11:30	1	2 3 4 5 6
14:30	1	3 4 5 6	12:20	1	2 3 4 5 6
15:00		7	13:30	1	2 3 4 5
15:15	1	3 4 5 6	14:00	1	2 3 4 5 6 7
16:00	1	3 4 5 6	14:00		6 7
17:00	1	3 4 5 6 7	15:00	1	2 3 4 5
18:00	1	3 4 5 6 7	14:45		6
19:00	1	3 4 5 6	15:00	1	2 3 4 5
20:00	1	3 5	15:30		7
21:00		4 6 7	16:00	1	2 3 4 5 6
21:30	1	3 5	16:20		6
			20:30	1	2 3 4 5
			17:20		6
			17:30	1	2 3 4 5 7
			18:30	1	2 3 4 5 6 7
			19:20		6
			19:45	1	2 3 4 5
			20:30	1	3 5
			21:30		2 4 6 7
			22:00	1	3 5
LARISSA-TYRNAVOS			TYRNAVOS-LARISSA		
Departure	Day	Arri val	Departure	Da y	Arri val
5:45	1	3 4 5 6	6:10	1	2 3 4 5 6
6:30	1	3 4 5 6	7:00	1	2 3 4 5 6

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6:45	1	3	4	5		7:10	7:30	1	2	3	4	5	6	7	7:55	
7:00	1	3	4	5	6	7	7:25	8:00	1	2	3	4	5	6	8:25	
7:15						7	7:40	8:30	1	2	3	4	5	6	7	8:55
7:30					6		7:55	9:15	1	2	3	4	5			9:40
8:00	1	3	4	5	6		8:25	9:30	1	2	3	4	5	6	7	9:55
8:15					6		8:40	10:10	1	2	3	4	5			10:35
9:00	1	3	4	5	6	7	9:25	10:30	1	2	3	4	5	6	7	10:55
9:15					6		9:40	11:30	1	2	3	4	5	6	7	11:55
10:00	1	3	4	5	6	7	10:25	12:30	1	2	3	4	5	6	7	12:55
11:00	1	3	4	5	6	7	11:25	13:30	1	2	3	4	5	6	7	13:55
12:00	1	3	4	5	6	7	12:25	14:00	1	2	3	4	5	6		14:25
13:00	1	3	4	5	6	7	13:25	14:30	1	2	3	4	5	6	7	14:55
13:30	1	3	4	5	6		13:55	15:00	1	2	3	4	5	6		15:25
14:00	1	3	4	5	6		14:25	15:30	1	2	3	4	5	6	7	15:55
14:30	1	3	4	5	6	7	14:55	16:30	1	2	3	4	5	6	7	16:55
15:00	1	3	4	5	6	7	15:25	17:30	1	2	3	4	5	6	7	17:55
16:00	1	3	4	5	6	7	16:25	18:30	1	2	3	4	5		7	18:55
17:00	1	3	4	5	6	7	17:25	19:30	1	2	3	4	5	6	7	19:55
17:30	1	3	4	5		7	17:55	20:00	1	2	3	4	5	6	7	20:25
18:00	1	3	4	5	6	7	18:25	20:30	1	2	3	4	5	6	7	20:55
19:00	1	3	4	5	6	7	19:25	21:45	1	2	3	4	5	6	7	22:10
19:30	1	3	4	5		7	19:55									
20:00	1	3	4	5	6	7	20:25									
21:00	1	3	4	5	6	7	21:25									
21:30	1	3		5			21:55									
LARISSA-KASTORIA							KASTORIA-LARISSA									
Departure	Day					Arri	Departure	Da					Arri			
15:15	1	3	4	5	6	7	18:15	7:15	1	2	3	4	5	6	7	10:15
20:45				5		7	23:45	14:30				5		7		15:30
LARISSA-IOANNINA							IOANNINA-LARISSA									
Departure	Day					Arri	Departure	Da					Arri			
10:15	1	3	4	5	6	7	13:15	9:00	1	2	3	4	5	6	7	12:00
15:00	1	3	4	5	6	7	18:00	14:30	1	2	3	4	5	6	7	17:30
20:00	1	3	4	5		7	23:00	18:30	1	2	3	4	5		7	21:30
LARISSA-GREVENA							GREVENA-LARISSA									
Departure	Day					Arri	Departure	Da					Arri			

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LARISSA-ARTA							ARTA-LARISSA									
Departure	Day						Arrival	Departure	Day						Arrival	
7:30	1	3	4	5	6	7	10:00	15:00	1	2	3	4	5	6	7	
LARISSA-KOZANI							KOZANI-LARISSA									
Departure	Day						Arrival	Departure	Day						Arrival	
15:00	1	3	4	5	6	7	19:30	9:45	1	2	3	4	5	6	7	
LARISSA-KOZANI							KOZANI-LARISSA									
Departure	Day						Arrival	Departure	Day						Arrival	
12:30	1	3	4	5	6	7	14:45	9:00	1	2	3	4	5	6	7	11:15
15:15	1	3	4	5	6	7	17:30	16:00	1	2	3	4	5	6	7	18:15
20:50	1	3	4	5	6	7	22:05	22:00	1	2	3	4	5	6	7	0:15

Table 220: Departures from Larissa

Below, Thessaloniki destinations current departure time is presented (table 221).

THESSALONI KI-KAVALA							KAVALA- THESSALON IKI									
Departure	Day						Arrival	Departure	Day						Arrival	
6:00	1	2	3	4	5	6	8:30	6:00	1	2	3	4	5	6	8:30	
8:00	1	2	3	4	5	6	10:30	7:00	1	2	3	4	5	6	9:20	
9:00	1	2	3	4	5	6	11:00	8:00	1	2	3	4	5	6	10:30	
9:30						7	11:30	9:00	1	2	3	4	5	6	7	11:00
10:00	1	2	3	4	5	6	12:30	10:00	1	2	3	4	5	6	7	12:30
11:00	1	2	3	4	5	6	13:20	11:00	1	2	3	4	5	6	7	13:20
12:00	1	2	3	4	5	6	14:30	12:00	1	2	3	4	5	6	7	14:30
13:00	1	2	3	4	5	6	15:00	13:00	1	2	3	4	5	6	7	15:00
14:00	1	2	3	4	5	6	16:30	14:00	1	2	3	4	5	6	7	16:30
15:00	1	2	3	4	5	6	17:20	15:00	1	2	3	4	5	6	7	17:20
16:00	1	2	3	4	5	6	18:30	16:00	1	2	3	4	5	6	7	18:30
17:00	1	2	3	4	5	6	19:00	17:00	1	2	3	4	5	6	7	19:00
18:00	1	2	3	4	5	6	20:30	18:00	1	2	3	4	5	6	7	20:30
19:00	1	2	3	4	5	6	21:20	19:00	1	2	3	4	5	6	7	21:20
20:00	1	2	3	4	5	6	22:30	20:40	1	2	3	4	5	6	7	23:10
22:00	1	2	3	4	5	6	0:30									

THESSALONI KI- KASTORIA							KASTORIA- THESSALON IKI								

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Departure	Day	Arrival	Departure	Day	Arrival
8:30	1 2 3 4 5 6	11:00	5:30	1 2 3 4 5 6	8:00
10:30		7 13:00	8:00	1 2 3 4 5 6 7	10:30
11:30	1 2 3 4 5 6	14:00	10:00	1 2 3 4 5 6 7	12:30
13:30	1 2 3 4 5 6 7	16:00	12:00	1 2 3 4 5 6 7	14:30
15:30	1 2 3 4 5 6 7	18:00	14:00	1 2 3 4 5 6 7	16:30
17:30	1 2 3 4 5 6 7	20:00	16:00	1 2 3 4 5 6 7	18:30
19:30	1 2 3 4 5 6 7	22:00	18:30	1 2 3 4 5 6 7	21:00
21:30	1 2 3 4 5 6 7	0:00			

THESSALONI KI-KOZANI			KOZANI- THESSALON IKI		
Departure	Day	Arrival	Departure	Day	Arrival
5:55	1 2 3 4 5	7:35	6:00	1 2 3 4 5	7:30
7:30	1 2 3 4 5 6 7	9:10	7:15	1 2 3 4 5 6 7	8:55
8:30	1 2 3 4 5	10:00	8:10	1 2 3 4 5	9:50
9:00		6 7 10:40	9:00	1 2 3 4 5 6 7	10:30
10:00	1 2 3 4 5	11:40	10:00	1 2 3 4 5 6 7	11:40
11:00	1 2 3 4 5 6	12:30	11:00	1 2 3 4 5 6 7	12:40
11:15		7 12:45	12:00	1 2 3 4 5 6 7	13:30
12:00	1 2 3 4 5 6 7	13:40	13:00	1 2 3 4 5 6 7	14:40
13:00	1 2 3 4 5 6 7	14:30	14:00	1 2 3 4 5 6 7	15:30
14:00	1 2 3 4 5 6 7	15:40	15:00	1 2 3 4 5 6 7	16:40
15:00	1 2 3 4 5 6 7	16:30	16:00	1 2 3 4 5 6 7	17:30
16:00	1 2 3 4 5 6 7	17:40	17:00	1 2 3 4 5 6 7	18:40
17:00	1 2 3 4 5 6 7	18:30	18:00	1 2 3 4 5 6 7	19:30
18:00	1 2 3 4 5 6 7	19:40	20:00	1 2 3 4 5 6 7	21:40
19:00	1 2 3 4 5 6 7	20:30			
20:00	1 2 3 4 5 6 7	21:40			
22:00	1 2 3 4 5 6 7	23:30			

THESSALONI KI-PTOLEMAID A			PTOLEMAID A- THESSALON IKI		
Departure	Day	Arrival	Departure	Day	Arrival
8:30	1 2 3 4 5	10:30	6:30	1 2 3 4 5	8:00
9:00		6 11:00	6:45		6 8:15
11:15	1 2 3 4 5 6 7	12:45	8:30	1 2 3 4 5 6 7	10:00
13:30	1 2 3 4 5 6 7	15:00	10:00	1 2 3 4 5 6 7	11:30

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15:30	1	2	3	4	5	6	7	17:00	13:00	1	2	3	4	5	6	14:30	
17:45	1	2	3	4	5	6	7	19:15	13:30						7	15:00	
20:15	1	2	3	4	5	6	7	21:45	15:30	1	2	3	4	5	6	7	17:00
									17:45	1	2	3	4	5	6	7	19:15
									19:30	1	2	3	4	5	6	7	21:00

THESSALONI KI-GREVENA								GREVENA- THESSALON IKI									
Departure				Day				Arriv al	Departure				Da y				Arriv al
8:30	1	2	3	4	5			10:30	6:15	1	2	3	4	5	6		8:15
10:30						6	7	12:30	8:15							7	10:15
12:00	1	2	3	4	5			14:00	9:15	1	2	3	4	5	6		11:15
15:15	1	2	3	4	5	6	7	17:15	12:45	1	2	3	4	5	6	7	14:45
18:30	1	2	3	4	5	6	7	20:30	16:00	1	2	3	4	5		7	18:00
20:30	1	2	3	4	5	6	7	22:30	17:00						6		19:00
									18:00	1	2	3	4	5		7	20:00

THESSALONI KI- IOANNINA								IOANNINA- THESSALON IKI									
Departure				Day				Arriv al	Departure				Da y				Arriv al
8:00	1	2	3	4	5	6	7	11:30	7:00	1	2	3	4	5	6	7	10:30
11:30	1	2	3	4	5	6	7	15:00	11:30	1	2	3	4	5	6	7	15:00
14:00	1	2	3	4	5	6	7	17:30	14:15	1	2	3	4	5	6	7	17:45
15:45	1	2	3	4	5	6	7	19:15	16:00	1	2	3	4	5	6	7	19:30
18:30	1	2	3	4	5	6	7	22:00	18:30	1	2	3	4	5		7	22:00
20:30	1	2	3	4	5	6	7	0:00	20:30	1	2	3	4	5	6	7	0:00

THESSALONI KI- IGOUMENIT SA								IGOUMENIT SA- THESSALON IKI									
Departure				Day				Arriv al	Departure				Da y				Arriv al
9:30	1	2	3	4	5	6	7	13:30	9:30	1	2	3	4	5	6	7	13:30
15:00	1	2	3	4	5	6	7	19:00	14:30	1	2	3	4	5	6	7	18:30

THESSALONIKI-ARTA						ARTA- THESSALONIKI							
Departure			Day			Arriv	Departure			Day			Arriv

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	al								al								
10:15	1	2	3	4	5	6	7	14:45	9:45	1	2	3	4	5	6	7	14:15
15:00	1	2	3	4	5		7	19:30	15:00	1	2	3	4	5		7	19:30

THESSALONI								GOUMENISSA-THESSALONIKI											
KI- GOUMENISSA								GOUMENISSA-THESSALONIKI											
A								GOUMENISSA-THESSALONIKI											
				Arriv								Arriv							
Departure		Day				al		Departure		Day				al					
6:30		1	2	3	4	5		7:45		6:00	1	2	3	4	5		7:15		
7:00		1	2	3	4	5	6	8:15		7:00	1	2	3	4	5	6	8:15		
8:00							7	9:15		8:00						7	9:15		
8:30		1	2	3	4	5	6	9:45		8:30	1	2	3	4	5	6	9:45		
10:00		1	2	3	4	5	6	7	11:15		10:00	1	2	3	4	5	6	7	11:15
11:30		1	2	3	4	5	6	12:45		11:30	1	2	3	4	5	6	12:45		
12:00							7	13:15		12:00						7	13:15		
13:00		1	2	3	4	5	6	14:15		13:00	1	2	3	4	5	6	14:15		
14:30		1	2	3	4	5	6	7	15:45		14:00	1	2	3	4	5	6	15:15	
16:00		1	2	3	4	5	6	7	17:15		14:30						7	15:45	
17:30							7	18:45		15:15	1	2	3	4	5	6	16:30		
17:45		1	2	3	4	5	6	19:00		16:00						7	17:15		
19:00							7	20:15		17:30	1	2	3	4	5	6	7	18:45	
19:45		1	2	3	4	5	6	21:00		19:00						7	20:15		
20:30							7	21:45		19:15	1	2	3	4	5	6	20:30		
21:15		1	2	3	4	5	6	7	22:30		20:30	1	2	3	4	5	6	7	21:45

THESSALONI								ASPROVALT											
KI- ASPROVALT								A- THESSALONIKI											
A								IKI											
				Arriv								Arriv							
Departure		Day				al		Departure		Day				al					
5:30		1	2	3	4	5	6	7	7:15		5:30	1	2	3	4	5	6	7	7:15
7:30		1	2	3	4	5	6	7	9:15		6:30	1	2	3	4	5	6	7	8:15
9:00		1	2	3	4	5	6	7	10:45		7:30	1	2	3	4	5	6	7	9:15
10:00		1	2	3	4	5	6	7	11:45		9:30	1	2	3	4	5	6	7	11:15
11:00		1	2	3	4	5	6	7	12:45		11:00	1	2	3	4	5	6	7	12:45
12:00		1	2	3	4	5	6	7	13:45		12:00	1	2	3	4	5	6	7	13:45
13:00		1	2	3	4	5	6	7	14:45		14:00	1	2	3	4	5	6	7	15:45
14:00		1	2	3	4	5	6	7	15:45		15:30	1	2	3	4	5	6	7	17:15
15:00		1	2	3	4	5	6	7	16:45		17:30	1	2	3	4	5	6	7	19:15
16:00		1	2	3	4	5	6	7	17:45		18:30	1	2	3	4	5	6	7	20:15
17:30		1	2	3	4	5	6	7	19:15		19:30	1	2	3	4	5	6	7	21:15

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18:30	1	2	3	4	5	6	7	20:15	20:30	1	2	3	4	5	6	7	22:15
19:30	1	2	3	4	5	6	7	21:15	21:30	1	2	3	4	5	6	7	23:15
21:30	1	2	3	4	5	6	7	23:15									

THESSALONI KI- ZAGKLIVERI									ZAGKLIVER I- THESSALON IKI								
7:15	1	2	3	4	5	6	7	8:05	Departure								Arrival
12:00	1	2	3	4	5	6	7	12:50	6:00	1	2	3	4	5	6	7	6:50
14:30	1	2	3	4	5	6	7	15:20	8:45	1	2	3	4	5	6	7	9:35
17:30	1	2	3	4	5	6	7	18:20	14:00	1	2	3	4	5	6	7	14:50
20:30	1	2	3	4	5	6	7	21:20	16:30	1	2	3	4	5	6	7	17:20
									19:30	1	2	3	4	5	6	7	20:20

THESSALONI KI- OLYMPIADA									OLYMPIADA - THESSALON IKI								
Departure								Arrival	Departure								Arrival
5:30	1	2	3	4	5			7:15	7:00	1	2	3	4	5			8:45
12:00						6	7	13:45	13:45						6	7	15:30
15:00	1	2	3	4	5	6	7	16:45	17:00	1	2	3	4	5	6	7	18:45

Table 221: Departures from Thessaloniki

Below, Alexandroupoli destinations current departure time is presented (table 222).

ALEXANDROUPOLI-KAVALA									KAVALA- ALEXANDROUPOLI								
Departure								Arrival	Departure								Arrival
5:15	1	2	3	4	5	6		7:15	10:00	1	2	3	4	5	6	7	12:00
8:00	1	2	3	4	5	6	7	10:00	13:15	1	2	3	4	5	6	7	15:15
11:00	1	2	3	4	5	6	7	13:00	16:45	1	2	3	4	5	6	7	18:45
14:00	1	2	3	4	5	6	7	16:00	20:30	1	2	3	4	5	6	7	22:30
16:45	1	2	3	4	5	6	7	18:45	1:45	1	2	3	4	5	6	7	3:45
18:45	1	2	3	4	5	6	7	20:45									
22:00	1	2	3	4	5	6	7	0:00									

ALEXANDROUPOLI-TICHERO									TICHERO- ALEXANDROUPOLI								

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Departure	Day	Arrival	Departure	Day	Arrival
6:05	1 2 3 4 5	6:50	6:50	1 2 3 4 5	7:35
7:30		8:15	8:15		9:00
8:45	1 2 3 4 5 6 7	9:30	9:30	1 2 3 4 5 6 7	10:15
12:30	1 2 3 4 5	13:15	13:15	1 2 3 4 5	14:00
13:30	1 2 3 4 5	14:15	14:15	1 2 3 4 5	15:00
15:30		16:15	16:15		17:00
19:00	1 2 3 4 5 6 7	19:45	19:45	1 2 3 4 5 6 7	20:30

ALEXANDROUPOLI-[...]-GEMISTI			GEMISTI-[...]-ALEXANDROUPOLI		
Departure	Day	Arrival	Departure	Day	Arrival
6:50	1 2 3 4 5	7:40	7:40	1 2 3 4 5	8:30
7:00		7:50	7:50		8:40
9:30		10:20	10:20		11:10
11:30	1 2 3 4 5 6	12:20	12:20	1 2 3 4 5 6	13:10
14:30	1 2 3 4 5 6	15:20	15:20	1 2 3 4 5 6	16:10
19:00	1 2 3 4 5 6 7	19:50	19:50	1 2 3 4 5 6 7	20:40

ALEXANDROUPOLI-LEFKIMMI			LEFKIMMI-ALEXANDROUPOLI		
Departure	Day	Arrival	Departure	Day	Arrival
6:10	1 2 3 4 5	7:00	7:00	1 2 3 4 5	7:50
13:30	1 2 3 4 5	14:20	14:20	1 2 3 4 5	15:10

ALEXANDROUPOLI-[...]-TRYFILLI			TRYFILLI-ALEXANDROUPOLI		
Departure	Day	Arrival	Departure	Day	Arrival
6:10	1	6:50	6:50	1	7:30
13:30	1 2 3 4 5	14:10	14:10	1 2 3 4 5	14:50

Table 222: Departures from Alexandroupoli

Below, Chalkida destinations current departure time is presented (table 223).

CHALKIDA-PSACHNA			PSACHNA-CHALKIDA		
Departure	Day	Arrival	Departure	Day	Arrival
7:00	1 2 3 4 5	7:30	5:30	1 2 3 4 5	6:00
8:00	1 2 3 4 5 6 7	8:30	6:30	1 2 3 4 5	7:00
8:30	1 2 3 4 5	9:00	6:45		7:15
9:00	1 2 3 4 5	9:30	7:00	1 2 3 4 5 6	7:30
9:30	1 2 3 4 5 6	10:00	7:30	1 2 3 4 5	8:00
10:30		11:00	8:00	1 2 3 4 5 6 7	8:30

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11:00	1 2 3 4 5	11:30	8:30	1 2 3 4 5	9:00
11:30	1 2 3 4 5 6 7	12:00	9:00	1 2 3 4 5 6	9:30
12:30	1 2 3 4 5 6 7	13:00	9:30	1 2 3 4 5	10:00
13:30	1 2 3 4 5 6 7	14:00	10:15	1 2 3 4 5 6 7	10:45
14:00	1 2 3 4 5	14:30	11:00	1 2 3 4 5 6 7	11:30
14:30	1 2 3 4 5 6 7	15:00	12:00		6 7 12:30
15:30	1 2 3 4 5 7	16:00	12:15	1 2 3 4 5	12:45
16:30	1 2 3 4 5 6 7	17:00	13:00	1 2 3 4 5 6	13:30
17:30	1 2 3 4 5 7	18:00	14:00	1 2 3 4 5 6 7	14:30
18:30	1 2 3 4 5 6 7	19:00	15:00	1 2 3 4 5 6 7	15:30
19:30	1 2 3 4 5 6 7	20:00	16:00		7 16:30
20:15	1 2 3 4 5	20:45	16:15	1 2 3 4 5	16:45
20:30		6 7 21:00	17:00	1 2 3 4 5 6 7	17:30
21:00		6 21:30	18:00	1 2 3 4 5 7	18:30
21:10	1 2 3 4 5 7	21:40	19:00		6 7 19:30
22:00		6 22:30	19:30	1 2 3 4 5	20:00
22:10	1 2 3 4 5 7	22:40	20:00		6 7 20:30
			20:30	1 2 3 4 5	21:00
			21:30		6 22:00
			21:40	1 2 3 4 5 7	22:10

CHALKIDA-ALIVERI				ALIVERI-CHALKIDA							
Departure	Day			Arriva	Departure	Day			Arriva		
	1	2	3	4	5	1	2	3	4	5	
7:05	1	2	3	4	5	8:05	1	2	3	4	5
7:40				6	7	8:40	1	2	3	4	5
9:30	1	2	3	4	5	6	7	10:30	1	2	3
11:15	1	2	3	4	5	6	7	12:15	1	2	3
12:15	1	2	3	4	5	6	7	13:15	1	2	3
13:00	1	2	3	4	5	14:00				6	12:05
14:00	1	2	3	4	5	6	7	15:00	1	2	3
15:30	1	2	3	4	5	16:30				6	13:05
16:00	1	2	3	4	5	6	7	17:00	1	2	3
18:15	1	2	3	4	5	6	7	19:15	1	2	3
20:15	1	2	3	4	5	6	7	21:15	1	2	3
22:00	1	2	3	4	5	6	7	23:00	1	2	3
									4	5	15:45
									5	6	17:10
											19:10
											20:50

CHALKIDA-KARISTOS				KARISTOS-CHALKIDA							
Departure	Day			Arriva	Departure	Day			Arriva		
	1	2	3	4	5	1	2	3	4	5	
13:00	1	2	3	4	5	16:10	1	2	3	4	5
											8:40

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18:15	1	2	3	4	5	6	7	21:25	13:45	1	2	3	4	5	7	16:55
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CHALKIDA-KIMI									KIMI-CHALKIDA								
								Arriva									Arriva
Departure	Day							1	Departure	Day							1
7:05	1	2	3	4	5			9:15	6:00	1	2	3	4	5	6	7	8:10
7:40						6	7	8:50	8:45	1	2	3	4	5	6	7	10:55
9:30	1	2	3	4	5	6	7	11:40	11:00	1	2	3	4	5	6	7	13:10
11:15	1	2	3	4	5	6	7	13:25	13:00	1	2	3	4	5	6	7	15:10
14:00	1	2	3	4	5	6	7	16:10	15:00	1	2	3	4	5	6	7	17:10
16:00	1	2	3	4	5	6	7	18:10	17:00	1	2	3	4	5	6	7	19:10
18:15	1	2	3	4	5	6	7	20:25	18:45	1	2	3	4	5	6	7	20:55
20:15	1	2	3	4	5	6	7	22:25									

CHALKIDA-ROVIES									ROVIES-CHALKIDA								
								Arriva									Arriva
Departure	Day							1	Departure	Day							1
8:00	1	2	3	4	5	6		10:15	5:50	1	2	3	4	5			8:05
12:30	1	2	3	4	5	6		14:45	12:00	1	2	3	4	5	6		14:15
17:15	1	2	3	4	5	6		19:30	16:30	1	2	3	4	5	6		18:45

CHALKIDA-OXILITHOS									OXILITHOS-CHALKIDA								
								Arriva									Arriva
Departure	Day							1	Departure	Day							1
12:15	1	2	3	4	5			14:15	7:10	1	2	3	4	5			9:10

CHALKIDA-GIMNO									GIMNO-CHALKIDA								
								Arriva									Arriva
Departure	Day							1	Departure	Day							1
10:30	1	2	3	4	5			11:30	7:00	1	2	3	4	5			8:00
14:45	1	2	3	4	5	6	7	15:45	7:10					6			8:10
19:30	1	2	3	4	5			20:30	9:15	1	2	3	4	5	6		10:15

CHALKIDA-ISTIAIA									ISTIAIA-CHALKIDA								
								Arriva									Arriva
Departure	Day							1	Departure	Day							1
14:30	1	2	3	4	5			17:45	6:00	1	2	3	4	5	6		9:15
									7:30							7	10:45

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CHALKIDA-AMARINTHOS							AMARINTHO S-CHALKIDA										
Departure						Arriva	Departure						Arriva				
Day						1	Day						1				
7:05	1	2	3	4	5	7:45	5:45	1	2	3	4	5	6	6:25			
7:40					6	8:20	7:10	1	2	3	4	5	7:50				
9:30	1	2	3	4	5	6	7	10:10	7:30	1	2	3	4	5	6	7	8:10
10:30	1	2	3	4	5	6	11:10	8:00	1	2	3	4	5	8:40			
11:15	1	2	3	4	5	6	7	11:55	8:30	1	2	3	4	5	6	7	9:10
12:15	1	2	3	4	5	6	7	12:55	9:25	1	2	3	4	5	6	10:05	
13:00	1	2	3	4	5	13:40	10:10	1	2	3	4	5	6	7	10:50		
14:00	1	2	3	4	5	6	7	14:40	10:45					6	11:25		
14:45	1	2	3	4	5	6	15:25	11:10	1	2	3	4	5	11:50			
15:30	1	2	3	4	5	16:10	11:25						7	12:05			
16:00	1	2	3	4	5	6	7	16:40	12:25	1	2	3	4	5	6	7	13:05
18:15	1	2	3	4	5	6	7	18:55	13:30	1	2	3	4	5	6	14:10	
19:30	1	2	3	4	5	20:10	14:30	1	2	3	4	5	6	7	15:10		
20:15	1	2	3	4	5	6	7	20:55	15:00					5	15:40		
22:00						7	22:40	16:30	1	2	3	4	5	6	7	17:10	
									18:20	1	2	3	4	5	6	19:00	
									18:30						7	19:10	
									20:00						7	20:40	
									20:10	1	2	3	4	5	6	20:50	

CHALKIDA-AVLONARI							AVLONARI-CHALKIDA						
Departure						Arriva	Departure						Arriva
Day						1	Day						1
12:15					6	13:45	7:40					6	9:10
							17:40	1	2	3	4	5	19:10

CHALKIDA-CHILIADOU							CHILIADOU-CHALKIDA						
Departure						Arriva	Departure						Arriva
Day						1	Day						1
13:00	1		3			15:40	6:50	1		3		5	9:30
14:00					5	16:40							

CHALKIDA-IOANNINA							IOANNINA-CHALKIDA								
Departure						Arriva	Departure						Arriva		
Day						1	Day						1		
10:00	1	2	3	4	5	7	17:30	12:00	1	2	3	4	5	7	19:30

Table 223: Departures from Chalkida

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Below, Karditsa destinations current departure time is presented (table 224).

KARDITSA-IOANNINA								IOANNINA-KARDITSA									
Departure	Da							Arri	Departure	Da							Arri
	y							val		y							val
14:30	1	2	3	4	5	6	7	17:30	12:00	1	2	3	4	5	6	7	15:00
15:00					5		7	18:00	13:45					5		7	16:45
								0								5	

KARDITSA-ANO KTIMENI								ANO KTIMENI-KARDITSA									
Departure	Da							Arri	Departure	Da							Arri
	y							val		y							val
6:00	1		3					7:10	7:10	1		3				8:20	
13:45	1		3					14:55	14:55	1		3				15:05	
								5							5		

KARDITSA-SOFADES								SOFADES-KARDITSA									
Departure	Da							Arri	Departure	Da							Arri
	y							val		y							val
1:00	1	2	3	4	5		7	1:35									
5:45	1		3					6:45	6:45	1		3				7:45	
6:25	1	2	3	4	5			7:25	7:25	1	2	3	4	5		8:25	
6:45						6		7:20	7:20						6	7:55	
7:00	1	2	3	4	5			7:40	7:40	1	2	3	4	5		8:20	
7:05	1	2	3	4	5			7:40	7:40	1	2	3	4	5		8:15	
8:10	1	2	3	4	5			8:30	8:30	1	2	3	4	5		8:50	
9:00	1	2	3	4	5	6	7	9:20	9:20	1	2	3	4	5	6	7	9:40
10:00	1	2	3	4	5			10:20	10:20	1	2	3	4	5		10:40	
								0							0		
10:45	1	2	3	4	5	6	7	11:05	11:05	1	2	3	4	5	6	7	11:25
								5							5		
11:15	1	2	3	4	5	6		12:30	11:50						7	12:25	
								0							5		
13:00	1	2	3	4	5	6	7	13:45	12:30	1	2	3	4	5		13:00	
								5							0		
13:45	1	2	3	4	5			14:20	13:20						7	13:40	
								0							0		
15:00	1	2	3	4	5	6	7	15:20	13:35					6		14:10	
								0						0			
17:30	1	2	3	4	5	6	7	17:50	13:45	1	2	3	4	5		14:30	
								0							0		
19:00							7	19:20	14:20	1	2	3	4	5		14:50	
								0							5		

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19:30					6	19:50										15:40
20:30	1	2	3	4	5	20:50										18:10
															7	19:40
																20:10
																21:10
																0

KARDITSA-KORDA						KORDA-KARDITSA										
Departure	Da					Arri	Departure	Da					Arri			
	y					val		y					val			
6:30	1	2	3	4	5	7:30	7:30	1	2	3	4	5	8:30			
7:30	1	2	3	4	5	6	8:30	8:30	1	2	3	4	5	6	9:30	
8:30						7	9:30	9:30						7	10:30	
11:00	1	2	3	4	5	12:00	12:00	1	2	3	4	5	13:00			
12:45	1	2	3	4	5	13:45	13:45	1	2	3	4	5	14:45			
13:30						7	14:30	14:30						7	15:30	
13:45	1	2	3	4	5	6	14:45	14:45	1	2	3	4	5	6	15:45	
15:30	1	2	3	4	5	16:30	16:30	1	2	3	4	5	17:30			
18:00						6	19:00	19:00						6	20:00	
18:15	1	2	3	4	5	19:15	19:15	1	2	3	4	5	20:15			
20:30	1	2	3	4	5	6	21:30	21:30	1	2	3	4	5	6	7	22:30

KARDITSA-RENTINA						RENTINA-KARDITSA									
Departure	Da					Arri	Departure	Da					Arri		
	y					val		y					val		
5:30	1		3		5	7:00	7:00	1		3		5			
13:45	1		3		5	6	15:15	15:15	1		3		5	6	7

KARDITSA-LOUTROPIGI						LOUTROPIGI-KARDITSA					
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Departure	Da	Arri	Departure	Da	Arri
	y	val		y	val
6:30	2 4	7:30	7:30	2 4	8:30
13:45	2 4	14:45	14:45	2 4	15:45
		5			5

KARDITSA-MESENIKOLA/MORFO OVOUNI					MESENIKOLA/MORFO VOUNI-KARDITSA				
Departure	Da	Arri	Departure	Da	Arri				
	y	val		y	val				
6:30	1 2 3 4 5	7:10	7:10	1 2 3 4 5	7:50				
13:30	1 2 3 4 5	14:10	14:10	1 2 3 4 5	14:50				
		0			0				

KARDITSA-NEOCHORI/FYLAkti					NEOCHORI/FYLAkti-KARDITSA				
Departure	Da	Arri	Departure	Da	Arri				
	y	val		y	val				
5:15	1 3 5	6:50	6:55	1 3 5	8:30				
5:30	2 4	7:05	7:10	2 4	8:45				
5:45	6	7:20	7:25	6	9:00				
6:00	7	7:35	7:40	7	9:15				
13:30	6 7	15:05	15:10	6 7	16:45				
13:45	1 3 4 5	15:20	15:25	1 3 5	17:00				
		0			0				

KARDITSA-NERAIDA/RACHOULA					NERAIDA/RACHOULA-KARDITSA				
Departure	Da	Arri	Departure	Da	Arri				
	y	val		y	val				
6:00	3 5	7:30	7:30	3 5	9:00				
6:15	3	7:45	7:45	3	9:15				
13:30	3 5	15:00	15:00	3 5	16:30				
		0			0				
14:15	3	15:45	15:45	3	17:15				
		5			5				

KARDITSA-RACHOULA					RACHOULA-KARDITSA				
Departure	Da	Arri	Departure	Da	Arri				
	y	val		y	val				

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6:15			3			6:45	6:45			3			7:15
6:50	1	2		4	5	7:20	7:20	1	2		4	5	7:50
14:15	1	2	3	4	5	14:4	14:45	1	2	3	4	5	15:1
						5							5

KARDITSA- APIDIA/DAFNOSPILIA						APIDIA/DAFNOSPILIA- KARDITSA							
Departure	Da					Arri	Departure	Da					Arri
	y					val		y					val
5:15			3			6:00	6:00			3			6:30
6:15	1	2		4	5	7:00	7:00	1	2		4	5	7:30
14:10	1	2	3	4	5	14:5	15:00	1	2	3	4	5	15:3
						5							0

KARDITSA- MOLOCHA						MOLOCHA-KARDITSA							
Departure	Da					Arri	Departure	Da					Arri
	y					val		y					val
5:15			3			6:45	6:45			3			8:15
14:10			3			15:4	15:40			3			17:1
						0							0

KARDITSA-MOUCHA						MOUCHA-KARDITSA							
Departure	Da					Arri	Departure	Da					Arri
	y					val		y					val
6:00			3			7:20	7:20			3			8:40
13:30			3			14:5	14:50			3			15:1
						0							0

KARDITSA-PORTITSA						PORTITSA-KARDITSA							
Departure	Da					Arri	Departure	Da					Arri
	y					val		y					val
8:30			3			9:00	9:00			3			9:40
12:30			3			13:0	13:00			3			13:4
						0							0

KARDITSA- KAROPLESI						KAROPLESI- KARDITSA							
Departure	Da					Arri	Departure	Da					Arri
	y					val		y					val
6:00			3			7:35	7:40			3			9:15
13:45			3			15:2	15:25			3			17:0

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0

KARDITSA-AIDONOCHORI/VATH YLAKOS					AIDONOCHORI/VATH YLAKOS-KARDITSA				
Departure	Da			Arri	Departure	Da		Arri	
	y			val		y		val	
6:00		3		7:30		3		9:00	
13:45		3		15:15		3		16:45	
				5				5	

KARDITSA-THRAPSIMI					THRAPSIMI-KARDITSA				
Departure	Da			Arri	Departure	Da		Arri	
	y			val		y		val	
7:00		3		7:45		3		8:30	
13:00		3		13:45		3		14:30	
				5				0	

KARDITSA-KEDRO/LOUTRO/PALI OURI					KEDRO/LOUTRO/PALI OURI-KARDITSA						
Departure	Da			Arri	Departure	Da		Arri			
	y			val		y		val			
7:00	1	2	3	4	5	7:40	1	2	3	4	5
13:00	1	2	3	4	5	13:40	1	2	3	4	5
						0					
13:45				6	14:25			6	14:45		
					5				5		

KARDITSA-MOYZAKI					MOYZAKI-KARDITSA										
Departure	Da			Arri	Departure	Da		Arri							
	y			val		y		val							
6:10	1	2	3	4	5	7:10	1	2	3	4	5				
7:00	1	2	3	4	5	6	7	8:00	1	2	3	4	5		
8:30	1	2	3	4	5	6	7	9:30	1	2	3	4	5	6	7
10:00					6	11:00					6	9:45			
						0									
10:45	1	2	3	4	5	11:45	1	2	3	4	5	6	7	10:30	
						5								0	
12:00	1	2	3	4	5	6	7	13:00	1	2	3	4	5	11:00	
								0						0	
13:00	1	2	3	4	5	7	14:00					6	12:00		
							0						0		

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6:20	1	2	3	4	5	7:30	y	7:30	1	2	3	4	5	8:00
13:45	1	2	3	4	5	14:10		14:10	1	2	3	4	5	15:00

TRIKALA-PIALEIA							PIALEIA-TRIKALA										
			Da				Arriv				Da				Arriv		
Departure			y				al	Departure			y				al		
7:00			1	2	3	4	5	8:00	8:00			1	2	3	4	5	9:00
11:30			1	2	3	4	5	12:15	12:15			1	2	3	4	5	13:00
13:05			1	2	3	4	5	13:35	13:35			1	2	3	4	5	15:00

TRIKALA-KOZIAKA							KOZIAKA-TRIKALA										
			Da				Arriv				Da				Arriv		
Departure			y				al	Departure			y				al		
6:00							6	7:15	7:15							6	8:30
6:30			1	2	3	4	5	7:15	7:15			1	2	3	4	5	8:00
6:30			1	2	3	4	5	7:15	7:15			1	2	3	4	5	8:00
11:30			1	2	3	4	5	12:15	12:15			1	2	3	4	5	13:00
13:45							6	14:25	14:25							6	15:00
13:50			1	2	3	4	5	14:40	14:40			1	2	3	4	5	15:20
13:50			1	2	3	4	5	14:40	14:40			1	2	3	4	5	15:20
15:20			1	2	3	4	5	16:15	16:15			1	2	3	4	5	17:10
21:10			1	2	3	4	5	22:05	22:05			1	2	3	4	5	23:00

TRIKALA-ELEFTHEROCHORI							ELEFTHEROCHORI-TRIKALA										
			Da				Arriv				Da				Arriv		
Departure			y				al	Departure			y				al		
6:55			1	2	3	4	5	7:30	7:30			1	2	3	4	5	8:00
11:30			1	2	3	4	5	12:15	12:15			1	2	3	4	5	13:00
13:30			1	2	3	4	5	14:15	14:15			1	2	3	4	5	15:00

TRIKALA-MOUZAKI							MOUZAKI-TRIKALA														
			Da				Arriv				Da				Arriv						
Departure			y				al	Departure			y				al						
6:45			1	2	3	4	5	6	7	7:30	7:30			1	2	3	4	5	6	7	8:00
8:30			1	2	3	4	5			9:15	9:15			1	2	3	4	5			10:00
11:20			1	2	3	4	5			12:10	12:10			1	2	3	4	5			13:00
11:30			1	2	3	4	5	6	7	13:00	13:00			1	2	3	4	5	6	7	13:00
14:00			1	2	3	4	5	6	7	14:40	14:40			1	2	3	4	5	6	7	15:30

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16:30	1	2	3	4	5	6	7	17:10	17:10	1	2	3	4	5	6	7	18:00
18:20	1	2	3	4	5			19:10	19:10	1	2	3	4	5			20:00
21:15	1	2	3	4	5	6	7	21:55	21:55	1	2	3	4	5	6	7	22:45

TRIKALA-PYLI									PYLI-TRIKALA										
				Da					Arriv					Da					Arriv
Departure				y					al	Departure				y					al
5:30	1	2	3	4	5			7:30	7:30	1	2	3	4	5			8:00		
6:45	1	2	3	4	5			8:00	8:00	1	2	3	4	5			8:20		
13:15	1	2	3	4	5			14:10	14:10	1	2	3	4	5			15:00		
13:15						6	7	14:45	14:45						6	7	15:30		
14:30	1	2	3	4	5			15:50											

TRIKALA-NEOCHORI/FARKA DONA									NEOCHORI/FARKAD ONA-TRIKALA										
				Da					Arriv					Da					Arriv
Departure				y					al	Departure				y					al
6:30	1	2	3	4	5			7:20	7:20	1	2	3	4	5			9:00		
6:50	1	2	3	4	5	6		7:40	7:40	1	2	3	4	5	6		8:30		
8:25	1							9:00	9:00	1							9:30		
8:30	1	2	3	4	5			9:10	9:10	1	2	3	4	5			9:45		
8:30	1							9:15	9:15	1							10:00		
11:05	1	2	3	4	5			12:10	12:10	1	2	3	4	5			13:00		
12:50	1	2	3	4	5			14:00	14:00	1	2	3	4	5			15:00		
13:10	1	2	3	4	5			14:20	14:20	1	2	3	4	5			15:30		
13:50	1	2	3	4	5			15:00	15:00	1	2	3	4	5			16:00		
13:50						6		14:45	14:45						6		15:30		
16:15	1	2	3	4	5			17:15	17:15	1	2	3	4	5			18:00		
21:05	1	2	3	4	5			21:50	21:50	1	2	3	4	5			22:30		

TRIKALA-TAKSIARCHES/NOM I									TAKSIARCHES/NOM I-TRIKALA										
				Da					Arriv					Da					Arriv
Departure				y					al	Departure				y					al
6:20	1							6:50	6:50	1							7:20		
6:50	1	2	3	4	5			7:30	7:30	1	2	3	4	5			8:00		
6:50						6		7:50	7:50						6		8:30		
7:10	1	2	3	4	5			7:40	7:40	1	2	3	4	5			8:10		
8:30	1	2	3	4	5			9:00	9:00	1	2	3	4	5			9:20		

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10:55	1	2	3	4	5	11:50	11:50	1	2	3	4	5	12:30
13:50					6	14:40	14:40					6	15:30
14:00	1	2	3	4	5	14:40	14:40	1	2	3	4	5	15:10
16:15	1	2	3	4	5	17:20	17:20	1	2	3	4	5	18:00
21:05	1	2	3	4	5	21:45	21:45	1	2	3	4	5	22:30

TRIKALA-SPATHADES						SPATHADES-TRIKALA							
	Da					Arriv		Da					Arriv
Departure	y					al		y					al
6:45	1					7:15		1					8:00

TRIKALA-AG.PARASKEVI						AG.PARASKEVI-TRIKALA							
	Da					Arriv		Da					Arriv
Departure	y					al		y					al
6:45	1					7:20		1					8:00

TRIKALA-MAVRELI/FOTEINO						MAVRELI/FOTEINO-TRIKALA							
	Da					Arriv		Da					Arriv
Departure	y					al		y					al
5:15	1			5		7:00		1			5		9:00

TRIKALA-ARTA/PREVEZA						PREVEZA/ARTA-TRIKALA								
	Da					Arriv		Da					Arriv	
Departure	y					al		y					al	
16:00	1	2	3	4	5	7	20:00	1	2	3	4	5	7	13:15

TRIKALA-GREVENA						GREVENA-TRIKALA										
	Da					Arriv		Da					Arriv			
Departure	y					al		y					al			
10:30	1	2	3	4	5	6	7	12:40	1	2	3	4	5	6	7	16:50

TRIKALA-IOANNINA						IOANNINA-TRIKALA							
Departure	Da					Arriv		Departure					Arriv

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y								Da									
al								al									
y								y									
8:30	1	2	3	4	5	6	7	11:10	8:45	1	2	3	4	5	6	7	10:55
15:00	1	2	3	4		6	7	17:40	15:30	1	2	3	4	5	6	7	18:10
15:30					5			18:10									

Table 225: Departures from Trikala

Below, Katerini destinations current departure time is presented (table 226).

KATERINI-KOLINDROS								KOLINDROS-KATERINI									
Arriva								Arriva									
Departure	Day							l	Departure	Day							l
6:15	1	2	3	4	5			7:00	7:00	1	2	3	4	5			7:45
6:50	1	2	3	4	5	6		7:35	8:00	1	2	3	4	5	6		8:45
13:00	1	2	3	4	5	6		13:45	14:00	1	2	3	4	5	6	7	14:45
19:00							7	19:45	21:00	1	2	3	4	5	6		21:45
KATERINI-ELASSONA								ELASSONA-KATERINI									
Arriva								Arriva									
Departure	Day							l	Departure	Day							l
7:20	1	2	3	4	5	6		8:50	8:55	1	2	3	4	5	6		10:25
13:00	1	2	3	4	5	6	7	14:30	15:30	1	2	3	4	5	6	7	17:00
16:00	1	2	3	4	5	6	7	17:30	18:00	1	2	3	4	5	6	7	19:30
KATERINI-ELATOCHORI								ELATOCHORI-KATERINI									
Arriva								Arriva									
Departure	Day							l	Departure	Day							l
6:45	1	2	3	4	5	6		7:30	7:30	1	2	3	4	5	6		8:15
12:45	1	2	3	4	5	6		13:30	13:30	1	2	3	4	5	6		14:15
14:30	1	2	3	4	5	6	7	15:15	15:15	1	2	3	4	5	6	7	16:00
18:30							7	19:15	19:15							7	20:00
19:45	1	2	3	4	5	6		20:30	20:30	1	2	3	4	5	6		21:15

Table 226: Departures from Katerini

Below, Veria destinations current departure time is presented (table 227).

VERIA-K.VRYSI								K.VRYSI-VERIA									
Da								Da									
Arriva								Arriva									
Departure	y							l	Departure	y							l
6:00	1	2	3	4	5			6:30	6:30	1	2	3	4	5			7:00
7:45	1	2	3	4	5	6		8:15	8:15	1	2	3	4	5	6		8:45
12:30	1	2	3	4	5			13:00	13:00	1	2	3	4	5			13:30
14:45	1	2	3	4	5	6		15:15	15:15	1	2	3	4	5	6		15:45

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17:30						7	18:00	18:00							7	18:30
19:15	1	2	3	4	5		19:45	19:45	1	2	3	4	5			20:15
VERIA-DASKIO								DASKIO-VERIA								
	Da						Arriva		Da							Arriva
Departure	y						l	Departure	y							l
6:45	1	2	3	4	5		8:00	8:00	1	2	3	4	5			9:15
13:00	1	2	3	4	5		14:15	14:15	1	2	3	4	5			15:30
15:00						7	16:15	16:15						7		17:30
VERIA-MARINA								MARINA-VERIA								
	Da						Arriva		Da							Arriva
Departure	y						l	Departure	y							l
7:00	1	2	3	4	5		7:30	7:30	1	2	3	4	5			8:00
13:15	1	2	3	4	5		13:45	13:45	1	2	3	4	5			14:15
VERIA-FYTIA								FYTIA-VERIA								
	Da						Arriva		Da							Arriva
Departure	y						l	Departure	y							l
6:50	1	2	3	4	5		7:15	7:15	1	2	3	4	5			7:40
14:30	1	2	3	4	5		14:55	15:00	1	2	3	4	5			15:25
VERIA-MONOSPITA A								MONOSPITA-VERIA								
	Da						Arriva		Da							Arriva
Departure	y						l	Departure	y							l
7:00	1	2	3	4	5		7:45	7:45	1	2	3	4	5			8:30
13:15	1	2	3	4	5		14:00	14:00	1	2	3	4	5			14:45

Table 227: Departures from Veria

Below, Florina destinations current departure time is presented (table 228).

FLORINA-IOANNINA								IOANNINA-FLORINA								
	Da						Arriv		Da							Arriv
Departure	y						al	Departure	y							al
14:00					5		17:00	13:00					5			16:00
16:15						7	19:15	18:00						7		21:00
FLORINA-KOZANI								KOZANI-FLORINA								
Departure	Da						Arriv	Departure	Da							Arriv

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	y						al		y							al	
7:00	1	2	3	4	5		8:45	6:45	1	2	3	4	5			8:30	
8:30	1	2	3	4	5	6	7	10:15	9:15	1	2	3	4	5		11:00	
11:15	1	2	3	4	5	6	7	13:00	11:15	1	2	3	4	5	6	7	13:00
14:00	1	2	3	4	5	6	7	15:45	14:15	1	2	3	4	5	6	7	16:00
16:00	1	2	3	4	5	6	7	17:45	16:00	1	2	3	4	5	6	7	17:45
18:00	1	2	3	4	5	6	7	19:45	18:30	1	2	3	4	5	6	7	20:15
FLORINA-MELITI									MELITI-FLORINA								
	Da						Arriv		Da							Arriv	
Departure	y						al	Departure	y							al	
7:00	1	2	3	4	5		7:40	7:40	1	2	3	4	5			8:20	
14:15	1	2	3	4	5		14:55	14:55	1	2	3	4	5			15:35	
FLORINA-SITARIA									SITARIA-FLORINA								
	Da						Arriv		Da							Arriv	
Departure	y						al	Departure	y							al	
6:45	1	2	3	4	5		7:30	7:30	1	2	3	4	5			8:15	
14:15	1	2	3	4	5		15:00	15:00	1	2	3	4	5			15:45	
FLORINA-MARINA									MARINA-FLORINA								
	Da						Arriv		Da							Arriv	
Departure	y						al	Departure	y							al	
6:50	1	2	3	4	5		7:30	7:30	1	2	3	4	5			8:10	
14:15	1	2	3	4	5		14:55	14:55	1	2	3	4	5			15:35	
FLORINA-NEOCHORAKI									NEOCHORAKI-FLORINA								
	Da						Arriv		Da							Arriv	
Departure	y						al	Departure	y							al	
7:00	1	2	3	4	5		7:25	7:25	1	2	3	4	5			7:50	
FLORINA-DROSOPIGI									DROSOPIGI-FLORINA								
	Da						Arriv		Da							Arriv	
Departure	y						al	Departure	y							al	
6:45	1	2	3	4	5		7:10	7:10	1	2	3	4	5			7:35	
FLORINA-KRYSTALLOPIGI									KRYSTALLOPIGI-FLORINA								
	Da						Arriv		Da							Arriv	
Departure	y						al	Departure	y							al	
7:00	1	2	3	4	5		8:00	8:00	1	2	3	4	5			9:00	
14:15	1	2	3	4	5		15:15	15:15	1	2	3	4	5			16:15	
FLORINA-K.A.									K.A. KLEINES-								

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KLEINES						FLORINA							
Da			Arriv			Da			Arriv				
Departure	y					Departure	y				Arriv		
6:55	1	2	3	4	5	7:35		1	2	3	4	5	8:15
14:15	1	2	3	4	5	14:55	14:55	1	2	3	4	5	15:35
FLORINA-KALLINIKI						KALLINIKI-FLORINA							
Da			Arriv			Da			Arriv				
Departure	y					Departure	y					Arriv	
6:45	1	2	3	4	5	7:10	7:10	1	2	3	4	5	7:35
14:15	1	2	3	4	5	14:40	14:40	1	2	3	4	5	15:05
FLORINA-LEMOS						LEMOS-FLORINA							
Da			Arriv			Da			Arriv				
Departure	y					Departure	y					Arriv	
7:00	1	2	3	4	5	8:00	8:00	1	2	3	4	5	9:00
14:00	1	2	3	4	5	15:00	15:00	1	2	3	4	5	16:00

Table 228: Departures from Florina

Below, Edessa destinations current departure time is presented (table 229).

EDESSA-ARIDEA						ARIDEA-EDESSA								
Da			Arriv			Da			Arriv					
Departure	y					Departure	y				Arriv			
7:00	1	2	3	4	5	7:30		1	2	3	4	5	8:00	
7:45	1	2	3	4	5	6	8:15	1	2	3	4	5	6	8:45
9:00				4		9:30				4			10:00	
10:00	1	2	3	4	5	10:30		1	2	3	4	5	11:00	
11:00	1	2	3	4	5	6	11:30	1	2	3	4	5	6	12:00
12:00	1	2	3	4	5	7	12:30	1	2	3	4	5	7	13:00
13:00	1	2	3	4	5		13:30	1	2	3	4	5		14:00
14:00					6	14:30					6		15:00	
14:30	1	2	3	4	5	15:00		1	2	3	4	5	15:30	
17:00	1	2	3	4	5	6	17:30	1	2	3	4	5	6	18:00
18:00						7	18:30					7	19:00	
19:00	1	2	3	4	5	6	19:30	1	2	3	4	5	6	20:00
EDESSA-GIANNITSA						GIANNITSA-EDESSA								
Da			Arriv			Da			Arriv					
Departure	y					Departure	y				Arriv			
9:00					7	9:45					7	10:45		
EDESSA-NISI/KARYDI						NISI/KARIDIA-EDESSA								

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A																
	Da					Arriv		Da						Arriv		
Departure	y					al		Departure	y					al		
6:50	1	2	3	4	5			7:10	1	2	3	4	5	7:30		
9:30				4				9:50				4		10:20		
12:45				4				13:05				4		13:25		
14:10	1	2	3	4	5			14:30	1	2	3	4	5	14:50		
EDESSA-KRIA							KRIA VRYSI-									
VRYSI							EDESSA									
	Da					Arriv		Da						Arriv		
Departure	y					al		Departure	y					al		
14:15	1	2	3	4	5	6		15:15	1	2	3	4	5	6	16:15	
EDESSA-							PANAGITSA-									
PANAGITSA							EDESSA									
	Da					Arriv		Da						Arriv		
Departure	y					al		Departure	y					al		
6:30	1	2	3	4	5			7:30	1	2	3	4	5	8:20		
14:10	1	2	3	4	5		15:00	15:00	1	2	3	4	5	15:50		
EDESSA-							SARAKINOI-									
SARAKINOI							EDESSA									
	Da					Arriv		Da						Arriv		
Departure	y					al		Departure	y					al		
8:00				4			8:20	8:20				4		8:40		
14:10				4			14:30	14:30				4		14:50		
EDESSA-							FLAMOURIA-									
FLAMOURIA							EDESSA									
	Da					Arriv		Da						Arriv		
Departure	y					al		Departure	y					al		
7:00	1	2	3	4	5		7:15	7:15	1	2	3	4	5	7:30		
9:15	1	2	3	4	5	6	9:30	9:30	1	2	3	4	5	6	9:45	
13:30	1	2	3	4	5	6	13:45	13:45	1	2	3	4	5	6	14:00	
14:30				4			14:45	14:45				4		15:00		
16:15	1	2	3	4	5		16:30	16:30	1	2	3	4	5	16:45		
18:15	1	2	3	4	5		18:30	18:30	1	2	3	4	5	18:45		
20:00	1	2	3	4	5	6	7	20:15	1	2	3	4	5	6	7	20:30
EDESSA-							MANDALOS-									
MANDALOS							EDESSA									
	Da					Arriv		Da						Arriv		
Departure	y					al		Departure	y					al		
14:15	1	2	3	4	5		15:00	15:00	1	2	3	4	5	15:45		
EDESSA-AGIA							AGIA FOTINI-									
FOTINI							EDESSA									
	Da					Arriv		Da						Arriv		
Departure	y					al		Departure	y					al		

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8:00					4	8:25	8:30						4	8:55	
14:30					4	14:55	15:00						4	15:25	
EDESSA-ZERVI							ZERVI EDESSA								
Departure		Da					Arrival	Departure		Da					Arrival
6:30	1	2	3	4	5	6:45	6:45	1	2	3	4	5	7:00		
7:15	1	2	3	4	5	7:30	7:30	1	2	3	4	5	7:45		
14:10	1	2	3	4	5	14:25	14:25	1	2	3	4	5	14:40		
EDESSA-GRAMMATIKO							GRAMMATIKO-EDESSA								
Departure		Da					Arrival	Departure		Da					Arrival
6:30	1	2	3	4	5	7:00	7:00	1	2	3	4	5	7:30		
7:00	1			4		7:30	7:30	1			4		8:00		
7:30	1	2	3	4	5	8:00	8:00	1	2	3	4	5	8:30		
14:10	1	2	3	4	5	14:40	14:40	1	2	3	4	5	15:10		
EDESSA-AG.ATHANASIOS							AG.ATHANASIOS-EDESSA								
Departure		Da					Arrival	Departure		Da					Arrival
6:40	1	2	3	4	5	7:15	7:15	1	2	3	4	5	7:50		
14:15	1	2	3	4	5	14:50	14:50	1	2	3	4	5	15:25		
EDESSA-MARGARITA							MARGARITA-EDESSA								
Departure		Da					Arrival	Departure		Da					Arrival
6:30	1	2	3	4	5	6:45	6:45	1	2	3	4	5	7:00		
14:15	1	2	3	4	5	14:30	14:30	1	2	3	4	5	14:45		
EDESSA-KALI							KALI-EDESSA								
Departure		Da					Arrival	Departure		Da					Arrival
6:45	1	2	3	4	5	7:05	7:05	1	2	3	4	5	7:25		
14:15	1	2	3	4	5	14:35	14:35	1	2	3	4	5	14:55		
EDESSA-VRYTTA							VRYTTA-EDESSA								
Departure		Da					Arrival	Departure		Da					Arrival
7:00	1	2	3	4	5	7:15	7:15	1	2	3	4	5	7:30		
7:45	1	2	3	4	5	8:00	8:00	1	2	3	4	5	8:15		
14:15	1	2	3	4	5	14:30	14:30	1	2	3	4	5	14:45		
EDESSA-							SAMARI-								

SAMARI						EDESSA					
	Da				Arriv		Da				Arriv
Departure	y				al	Departure	y				al
7:30	1	2	3	4	7:40	7:40	1	2	3	4	7:50
8:15	1	2	3	4	8:25	8:25	1	2	3	4	8:35
11:15	1	2	3	4	11:25	11:25	1	2	3	4	11:35
13:45	1	2	3	4	13:55	13:55	1	2	3	4	14:05
17:45	1	2	3	4	17:55	17:55	1	2	3	4	18:05
20:00	1	2	3	4	20:10	20:10	1	2	3	4	20:20
EDESSA-LOUTROCHO RI						LOUTROCHO RI-EDESSA					
	Da				Arriv		Da				Arriv
Departure	y				al	Departure	y				al
13:15	1	2	3	4	13:45	13:45	1	2	3	4	14:15
EDESSA-SEVASTIANA						SEVASTIANA-EDESSA					
	Da				Arriv		Da				Arriv
Departure	y				al	Departure	y				al
14:15	1	2	3	4	14:35	14:35	1	2	3	4	14:55
EDESSA-MESIMERI						MESIMERI-EDESSA					
	Da				Arriv		Da				Arriv
Departure	y				al	Departure	y				al
7:45	1	2	3	4	8:55	9:00	1	2	3	4	9:10
14:10	1	2	3	4	14:20	14:20	1	2	3	4	14:30
EDESSA-IOANNINA						IOANNINA-EDESSA					
	Da				Arriv		Da				Arriv
Departure	y				al	Departure	y				al
13:45				5	16:15	17:45				5	20:15
EDESSA-KOZANI						KOZANI-EDESSA					
	Da				Arriv		Da				Arriv
Departure	y				al	Departure	y				al
15:00				5	16:30	17:00				5	18:30
18:00				7	19:30	20:00				7	21:30

Table 229: Departures from Edessa

Below, Xanthi destinations current departure time is presented (table 230).

XANTHI-DASOCHORI						DASOCHORI-XANTHI					
					Arriva						Arriva
Departure	Day				l	Departure	Day				l

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6:40	1	2	3	4	5	7:15	7:15	1	2	3	4	5	7:50
9:00					6	9:35	9:35					6	10:10
14:30					6	15:05	15:05					6	15:40
14:40						15:15	15:15						15:50

XANTHI-GKIONA							GKIONA-XANTHI						
						Arriva							Arriva
Departure	Day					1	Departure	Day					1
6:40	1	2	3	4	5	7:00	7:00	1	2	3	4	5	7:20
9:00					6	9:20	9:20					6	9:40
14:30					6	14:50	14:50					6	15:10
14:40						15:00	15:00						15:20
17:00	1	2	3	4	5	17:20	17:20	1	2	3	4	5	17:40

XANTHI-ERASMIO							ERASMIO-XANTHI						
						Arriva							Arriva
Departure	Day					1	Departure	Day					1
7:10	1	2	3	4	5	7:40	7:40	1	2	3	4	5	8:10
14:00	1	2	3	4	5	14:30	14:30	1	2	3	4	5	15:00

XANTHI-MIKROCHORI							MIKROCHORI-XANTHI						
						Arriva							Arriva
Departure	Day					1	Departure	Day					1
6:40	1	2	3	4	5	7:15	7:15	1	2	3	4	5	7:50
9:00					6	9:35	9:35					6	10:10
14:30					6	15:05	15:05					6	15:40
14:40						15:15	15:15						15:50
17:00	1	2	3	4	5	17:35	17:35	1	2	3	4	5	18:10

XANTHI-OLVIO							OLVIO-XANTHI						
						Arriva							Arriva
Departure	Day					1	Departure	Day					1
7:10	1	2	3	4	5	7:40	7:40	1	2	3	4	5	8:10
14:00	1	2	3	4	5	14:30	14:30	1	2	3	4	5	15:00

XANTHI-THALASSIA							THALASSIA-XANTHI						
Departure	Day					Arriva	Departure	Day					Arriva

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					1						1	
6:40	1	2	3	4	5	6:55	1	2	3	4	5	7:10
9:00					6	9:15					6	9:30
14:30					6	14:45					6	15:00
14:40	1	2	3	4	5	14:55	1	2	3	4	5	15:10
17:00	1	2	3	4	5	17:15	1	2	3	4	5	17:30

XANTHI-GALANI						GALANI-XANTHI						
					Arriva						Arriva	
Departure	Day				1	Departure	Day				1	
8:00	1	2	3	4	5	8:15	1	2	3	4	5	8:30
14:30	1	2	3	4	5	14:45	1	2	3	4	5	15:00

XANTHI-TOKSOTES						TOKSOTES-XANTHI						
					Arriva						Arriva	
Departure	Day				1	Departure	Day				1	
7:00	1	2	3	4	5	7:15	1	2	3	4	5	7:30
8:00	1	2	3	4	5	8:15	1	2	3	4	5	8:30
11:00	1	2	3	4	5	11:15	1	2	3	4	5	11:30
13:30	1	2	3	4	5	13:45	1	2	3	4	5	14:00
14:40	1	2	3	4	5	14:55	1	2	3	4	5	15:10
17:00	1	2	3	4	5	17:15	1	2	3	4	5	17:30

XANTHI-AMISSOS						AMISSOS-XANTHI						
					Arriva						Arriva	
Departure	Day				1	Departure	Day				1	
6:40	1	2	3	4	5	6:50	1	2	3	4	5	7:00
9:30	1	2	3	4	5	9:40	1	2	3	4	5	9:50
14:40	1	2	3	4	5	14:50	1	2	3	4	5	15:00
17:00	1	2	3	4	5	17:10	1	2	3	4	5	17:20

XANTHI-POTAMIA						POTAMIA-XANTHI						
					Arriva						Arriva	
Departure	Day				1	Departure	Day				1	
6:35	1	2	3	4	5	6:55	1	2	3	4	5	7:15
14:25	1	2	3	4	5	14:45	1	2	3	4	5	15:05

XANTHI-AVDYRA						AVDYRA-XANTHI					
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XANTHI- MANDRA						MANDRA- XANTHI							
Departure					Arriva	Departure					Arriva		
Day					1	Day					1		
6:35	1	2	3	4	5	7:05	7:05	1	2	3	4	5	7:35
8:00	1	2	3	4	5	8:30	8:30	1	2	3	4	5	9:00
10:00	1	2	3	4	5	10:30	10:30	1	2	3	4	5	11:00
12:30	1	2	3	4	5	13:00	13:00	1	2	3	4	5	13:30
14:40	1	2	3	4	5	15:10	15:10	1	2	3	4	5	15:40
17:30	1	2	3	4	5	18:00	18:00	1	2	3	4	5	18:30
20:00	1	2	3	4	5	20:30	20:30	1	2	3	4	5	21:00

XANTHI- VELONI						VELONI- XANTHI							
Departure					Arriva	Departure					Arriva		
Day					1	Day					1		
6:35	1	2	3	4	5	7:05	7:05	1	2	3	4	5	7:35
8:00	1	2	3	4	5	8:30	8:30	1	2	3	4	5	9:00
10:00	1	2	3	4	5	10:30	10:30	1	2	3	4	5	11:00
12:30	1	2	3	4	5	13:00	13:00	1	2	3	4	5	13:30
14:40	1	2	3	4	5	15:10	15:10	1	2	3	4	5	15:40
17:30	1	2	3	4	5	18:00	18:00	1	2	3	4	5	18:30
20:00	1	2	3	4	5	20:30	20:30	1	2	3	4	5	21:00

XANTHI- SELINO						SELINO- XANTHI							
Departure					Arriva	Departure					Arriva		
Day					1	Day					1		
7:10	1	2	3	4	5	7:45	7:10	1	2	3	4	5	7:35
15:00	1	2	3	4	5	15:35	15:10	1	2	3	4	5	15:40

XANTHI- POLYSITO						POLYSITO- XANTHI							
Departure					Arriva	Departure					Arriva		
Day					1	Day					1		
7:10	1	2	3	4	5	7:30	7:10	1	2	3	4	5	7:45
14:00	1	2	3	4	5	14:20	15:35	1	2	3	4	5	16:10

XANTHI-						SOUNIO-							
Departure					Arriva	Departure					Arriva		
Day					1	Day					1		
7:10	1	2	3	4	5	7:30	7:30	1	2	3	4	5	7:50
14:00	1	2	3	4	5	14:20	14:20	1	2	3	4	5	14:40

XANTHI-						SOUNIO-					
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SOUNIO								XANTHI							
							Arriva								Arriva
Departure	Day						l	Departure	Day						l
6:30	1	2	3	4	5	6	6:50	6:50	1	2	3	4	5	6	7:10
8:10	1	2	3	4	5	6	8:30	8:30	1	2	3	4	5	6	8:50
8:30						7	8:50	8:50					7	9:10	
8:50	1	2	3	4	5	6	9:10	9:10	1	2	3	4	5	6	9:30
9:10						6	9:30	9:30					6	9:50	
10:50	1	2	3	4	5	6	11:10	11:10	1	2	3	4	5	6	11:30
11:30						7	11:50	11:50					7	12:10	
12:30	1	2	3	4	5	6	12:50	12:50	1	2	3	4	5	6	13:10
14:20	1	2	3	4	5	6	14:40	14:40	1	2	3	4	5	6	15:00
14:30						7	14:50	14:50					7	15:10	
15:00	1	2	3	4	5	6	15:20	15:20	1	2	3	4	5	6	15:40
17:00						7	17:20	17:20					7	17:40	
17:30						6	17:50	17:50					6	18:10	
19:30						7	19:50	19:50					7	20:10	
20:30						6	20:50	20:50					6	21:10	

XANTHI-FILIA								FILIA-XANTHI							
							Arriva								Arriva
Departure	Day						l	Departure	Day						l
6:30	1	2	3	4	5	6:50	6:50	1	2	3	4	5	7:10		
7:15					6	7:35	7:35					6	7:55		
8:10	1	2	3	4	5	8:30	8:30	1	2	3	4	5	8:50		
8:50	1	2	3	4	5	6	9:10	9:10	1	2	3	4	5	6	9:30
10:00					6	10:20	10:20					6	10:40		
10:50	1	2	3	4	5	11:10	11:10	1	2	3	4	5	11:30		
12:30	1	2	3	4	5	6	12:50	12:50	1	2	3	4	5	6	13:10
14:20	1	2	3	4	5	14:40	14:40	1	2	3	4	5	15:00		
14:30					6	14:50	14:50					6	15:10		
15:00	1	2	3	4	5	15:20	15:20	1	2	3	4	5	15:40		

XANTHI-SIMANDRA								SIMANDRA-XANTHI							
							Arriva								Arriva
Departure	Day						l	Departure	Day						l
6:30	1	2	3	4	5	6:55	6:55	1	2	3	4	5	7:20		
8:10	1	2	3	4	5	6	8:35	8:35	1	2	3	4	5	6	9:00
8:50	1	2	3	4	5	6	9:15	9:15	1	2	3	4	5	6	9:40
9:15					6	9:40	9:40					6	10:05		
10:50	1	2	3	4	5	6	11:15	11:15	1	2	3	4	5	6	11:40
12:30	1	2	3	4	5	6	12:55	12:55	1	2	3	4	5	6	13:20
14:20	1	2	3	4	5	6	14:45	14:45	1	2	3	4	5	6	15:10

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XANTHI-GRIGORO					GRIGORO-XANTHI									
Departure	Day				Arriva	Departure	Day				Arriva			
8:10	1	2	3	4	5	6	8:30	1	2	3	4	5	6	8:50
12:30	1	2	3	4	5	6	12:50	1	2	3	4	5	6	13:10

XANTHI-AKARPO					AKARPO-XANTHI									
Departure	Day				Arriva	Departure	Day				Arriva			
7:15	1	2	3	4	5	6	7:30	1	2	3	4	5	6	7:45
10:00						6	10:15						6	10:30
13:00						6	13:15						6	13:30

XANTHI-OREON					OREON-XANTHI							
Departure	Day				Arriva	Departure	Day				Arriva	
6:00	1				5	6:45	1				5	7:30
14:30	1				5	15:15	1				5	16:00

XANTHI-KOTYLI					KOTYLI-XANTHI							
Departure	Day				Arriva	Departure	Day				Arriva	
5:30	1	2	3	4	5	6:15	1	2	3	4	5	7:00
6:15					6	7:00					6	7:45
13:00					6	13:45					6	14:30
14:40	1	2	3	4	5	15:25	1	2	3	4	5	16:10

XANTHI-KENTAVROS					KENTAVROS-XANTHI							
Departure	Day				Arriva	Departure	Day				Arriva	
6:15					6	6:55					6	7:35
6:20	1	2	3	4	5	7:00	1	2	3	4	5	7:40
13:00					6	13:40					6	14:20
14:40	1	2	3	4	5	15:20	1	2	3	4	5	16:00

XANTHI-MEDOUSA					MEDOUSA-XANTHI						
Departure	Day				Arriva	Departure	Day				Arriva

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						1										1
6:00		1	2	3	4	5		6:50		1	2	3	4	5		7:40
14:50		1	2	3	4	5		15:40		1	2	3	4	5		16:30

XANTHI-DIMARIO							DIMARIO-XANTHI								
Departure						Arriva	Departure						Arriva		
Day						1	Day						1		
6:00		1	2	3	4	5	6:50		1	2	3	4	5		1
14:40		1	2	3	4	5	15:30		1	2	3	4	5		16:20

XANTHI-PACHNI							PACHNI-XANTHI								
Departure						Arriva	Departure						Arriva		
Day						1	Day						1		
6:10		1	2	3	4	5	7:00		1	2	3	4	5		7:50
6:30						6	7:20						6		8:10
13:00						6	13:50						6		14:40
14:50		1	2	3	4	5	15:40		1	2	3	4	5		16:30

XANTHI-MYKI							MYKI-XANTHI									
Departure						Arriva	Departure						Arriva			
Day						1	Day						1			
5:30		1	2	3	4	5	5:55		1	2	3	4	5		6:20	
6:10		1	2	3	4	5	6:35		1	2	3	4	5		7:00	
6:20		1	2	3	4	5	6:45		1	2	3	4	5		7:10	
6:15						6	6:40						6		7:05	
6:30						6	6:55						6		7:20	
7:00		1	2	3	4	5	7:25		1	2	3	4	5		7:50	
11:00		1	2	3	4	5	11:25		1	2	3	4	5		11:50	
13:00		1	2	3	4	5	6	13:25		1	2	3	4	5	6	13:50
14:40		1	2	3	4	5	15:05		1	2	3	4	5		15:30	

XANTHI-GLAFKI							GLAFKI-XANTHI									
Departure						Arriva	Departure						Arriva			
Day						1	Day						1			
6:10		1	2	3	4	5	6:45		1	2	3	4	5		7:20	
6:30		1	2	3	4	5	7:05		1	2	3	4	5		7:40	
7:00		1	2	3	4	5	7:35		1	2	3	4	5		8:10	
11:00		1	2	3	4	5	11:35		1	2	3	4	5		12:10	
13:00		1	2	3	4	5	6	13:35		1	2	3	4	5	6	14:10

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14:40	1	2	3	4	5	15:15	15:15	1	2	3	4	5	15:50
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XANTHI-KOMNINA							KOMNINA-XANTHI						
Departure	Day					Arriva	Departure	Day					Arriva
5:30	1	2	3	4	5	6:20	6:20	1	2	3	4	5	7:10
14:20	1	2	3	4	5	15:10	15:10	1	2	3	4	5	16:00
14:30					6	15:20	15:20					6	16:10

XANTHI-PASCHALIA							PASCHALIA-XANTHI						
Departure	Day					Arriva	Departure	Day					Arriva
5:30	1	2	3	4	5	6:20	6:20	1	2	3	4	5	7:10
14:20	1	2	3	4	5	15:10	15:10	1	2	3	4	5	16:00
14:30					6	15:20	15:20					6	16:10

Table 230: Departures from Xanthi

Below, Volos destinations current departure time is presented (table 231).

VOLOS-KOZANI								KOZANI-VOLOS									
Departure	Day							Arrival	Departure	Day							Arrival
14:15	1	2	3	4	5	6	7	17:30	8:45	1	2	3	4	5	6	7	12:00
19:45					5	7	23:00	16:00					5	7	19:15		

VOLOS-IOANNINA								IOANNINA-VOLOS									
Departure	Day							Arrival	Departure	Day							Arrival
8:00	1	2	3	4	5	6	7	12:30	10:15	1	2	3	4	5	6	7	14:45
13:30	1	2	3	4	5	6	7	18:00	15:00	1	2	3	4	5	6	7	19:30
17:30	1	2	3	4	5	6	22:00	20:00	1	2	3	4	5	6	0:30		

VOLOS-ACHILLEIO								ACHILLEIO-VOLOS											
Departure	Day							Arrival	Departure	Day							Arrival		
5:45	1	2	3	4	5		7:10	8:00	1	2	3	4	5		9:25				
7:00	1	2	3	4	5		8:25	10:05	1	2	3	4	5	6	7	11:30			
11:30	1	2	3	4	5	6	7	12:55	15:45	1	2	3	4	5	6	7	17:10		
14:30	1	2	3	4	5	6	7	15:55	16:45	1	2	3	4	5	6	7	18:10		
18:00	1	2	3	4	5	6	7	19:25	19:45	1	2	3	4	5	6	7	21:10		

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VOLOS- AGNANTERI							AGNANTERI- VOLOS							
Departure						Arrival	Departure						Arrival	
Day							Day							
6:00	1	2	3	4	5	7:00	7:15	1	2	3	4	5	8:15	
6:30					6	7:30	7:30				6	8:30		
8:30	1	2	3	4	5	9:30	9:30	1	2	3	4	5	6	10:30
13:30	1	2	3	4	5	14:30	14:30				6	15:30		
						14:50	14:50	1	2	3	4	5	15:50	

VOLOS- ALMYROS							ALMYROS- VOLOS										
Departure						Arrival	Departure						Arrival				
Day							Day										
5:30	1	2	3	4	5	6:15	6:15	1	2	3	4	5	7:00				
5:45	1	2	3	4	5	6:30	7:10	1	2	3	4	5	6	7	7:55		
6:25	1	2	3	4	5	6	7	7:10	7:45	1	2	3	4	5	8:30		
7:00	1	2	3	4	5	6	7	7:45	8:30				6	9:15			
7:45					6	8:30	9:00	1	2	3	4	5	9:45				
8:30	1	2	3	4	5	6	7	9:15	9:30	1	2	3	4	5	6	7	10:15
9:30	1	2	3	4	5	6	7	10:15	10:00	1	2	3	4	5	10:45		
10:30	1	2	3	4	5	6	7	11:15	10:30				6	7	11:15		
11:30	1	2	3	4	5	6	7	12:15	11:00	1	2	3	4	5	6	7	11:45
12:00					6	7	12:45	12:00	1	2	3	4	5	6	7	12:45	
12:30	1	2	3	4	5	13:15	13:15	1	2	3	4	5	14:00				
13:00					7	13:45	13:30				6	7	15:15				
13:30	1	2	3	4	5	14:15	14:30	1	2	3	4	5	6	15:15			
14:30	1	2	3	4	5	6	7	15:15	15:00				6	7	15:45		
15:30	1	2	3	4	5	6	7	16:15	15:15	1	2	3	4	5	16:00		
17:00	1	2	3	4	5	6	7	17:45	15:45	1	2	3	4	5	16:30		
18:00	1	2	3	4	5	6	7	18:45	16:30	1	2	3	4	5	6	7	17:15
20:00	1	2	3	4	5	6	7	20:45	17:00	1	2	3	4	5	6	17:45	
21:45	1	2	3	4	5	6	7	22:30	17:30	1	2	3	4	5	6	7	18:15
								18:30	1	2	3	4	5	6	7	19:15	
								20:30	1	2	3	4	5	6	7	21:15	
								21:15	1	2	3	4	5	6	7	22:00	
								22:30	1	2	3	4	5	6	7	23:15	

VOLOS- AMALIAPOLI							AMALIAPOLI- VOLOS						
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Departure	Day	Arrival	Departure	Day	Arrival
9:30	1 2 3 4 5 7	10:36	11:30	1 2 3 4 5 7	12:36
11:30	1 2 3 4 5 7	12:36	13:50	1 2 3 4 5 6 7	14:56
12:00	1 2 3 4 5 6	13:06			

VOLOS-DRYMON			DRYMON-VOLOS		
Departure	Day	Arrival	Departure	Day	Arrival
5:30	1 2 3 4 5	6:50	7:20	1 2 3 4 5	8:40
9:30	1 2 3 4 5 6	10:50	11:15	1 2 3 4 5 6	12:35
11:15	1 2 3 4 5	12:35	14:30	1 2 3 4 5	15:50
12:30	1 2 3 4 5	13:50			

VOLOS-ELEFTHEROCH ORI			ELEFTHEROCH ORI-VOLOS		
Departure	Day	Arrival	Departure	Day	Arrival
6:15	1 2 3 4 5	7:15	7:00	1 2 3 4 5	8:00
6:30	6	7:30	8:00	6	9:00
13:30	1 2 3 4 5 6	14:30	14:45	1 2 3 4 5	15:45
			15:00	6	16:00

VOLOS-GLYFA			GLYFA-VOLOS		
Departure	Day	Arrival	Departure	Day	Arrival
7:00	1 2 3 4 5	8:30	10:00	1 2 3 4 5	11:45
14:30	1 2 3 4 5	16:00	16:30	1 2 3 4 5	18:15

VOLOS-PELASGIA			PELASGIA-VOLOS		
Departure	Day	Arrival	Departure	Day	Arrival
5:45	1 2 3 4 5	7:30	5:45	1 2 3 4 5	7:30
11:30	1 2 3 4 5	13:15	7:30	1 2 3 4 5	9:15
			11:30	1 2 3 4 5	13:15
			13:15	1 2 3 4 5	15:00

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VOLOS-SESKLO							SESKLO-VOLOS										
Departure	Day						Arrival	Departure	Day						Arrival		
7:00	1	2	3	4	5	7:20	7:30	1	2	3	4	5	7:50				
7:30	1	2	3	4	5	6	7	7:50	8:00	1	2	3	4	5	6	7	8:20
12:45	1	2	3	4	5	6	7	13:05	13:15	1	2	3	4	5	6	7	13:35
14:30	1	2	3	4	5	14:50	15:00	1	2	3	4	5	15:20				
15:30	1	2	3	4	5	6	15:50	16:00	1	2	3	4	5	6	16:20		
17:30	1	2	3	4	5	6	7	17:50	18:00	1	2	3	4	5	6	7	18:20
21:00	1	2	3	4	5	6	7	21:20	21:20	1	2	3	4	5	6	7	21:40

VOLOS-AG IOANNIS KISSOU							AG IOANNIS KISSOU-VOLOS								
Departure	Day						Arrival	Departure	Day						Arrival
4:15	1	2	3	4	5	6:45	7:15	1	2	3	4	5	9:45		
5:30						6	8:00	8:15					6	10:45	
13:30	1	2	3	4	5	6	7	16:00	16:45					6	18:45

VOLOS-ZAGORA							ZAGORA-VOLOS										
Departure	Day						Arrival	Departure	Day						Arrival		
5:45	1	2	3	4	5	8:45	8:30	1	2	3	4	5	11:30				
8:30	1	2	3	4	5	6	7	11:30	14:00	1	2	3	4	5	6	7	16:00
14:15	1	2	3	4	5	6	7	17:15	18:15	1	2	3	4	5	6	7	21:15

VOLOS-KANALIA							KANALIA-VOLOS									
Departure	Day						Arrival	Departure	Day						Arrival	
5:45	1	2	3	4	5	6:45	7:10	1	2	3	4	5	8:10			
6:15	1	2	3	4	5	7:15	8:00	1	2	3	4	5	9:00			
6:30						6	7	7:30	8:30					6	7	9:30
12:30	1	2	3	4	5	6	7	13:30	13:30					6	7	14:30
14:15	1	2	3	4	5	6	15:15	14:15	1	2	3	4	5	15:15		
16:00	1	2	3	4	5	6	7	17:00	16:30	1	2	3	4	5	6	17:30
18:15	1	2	3	4	5	19:15	17:00	1	2	3	4	5	6	18:00		
20:30	1	2	3	4	5	6	7	21:30	18:30						7	19:30
									19:15	1	2	3	4	5	20:15	

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Departure	Day	Arrival	Departure	Day	Arrival
6:00	1 2 3 4 5	7:00	7:00	1 2 3 4 5	8:00
6:30	1 2 3 4 5	7:30	8:20	1 2 3 4 5	9:20
13:30	1 2 3 4 5	14:30	14:30	1 2 3 4 5	15:30

VOLOS-MILIES			MILIES-VOLOS		
Departure	Day	Arrival	Departure	Day	Arrival
5:45	1 2 3 4 5	7:05	7:00	1 2 3 4 5	8:20
6:30	1 2 3 4 5	7:50	8:15	1 2 3 4 5 6 7	9:35
7:00		6 7 8:20	10:15	1 2 3 4 5	11:35
9:15		6 7 10:35	10:30		6 7 11:50
12:00	1 2 3 4 5	13:20	13:45	1 2 3 4 5	15:05
13:15		6 7 14:35	14:30	1 2 3 4 5 6 7	15:50
13:30	1 2 3 4 5	14:50	19:15	1 2 3 4 5 6 7	20:35
18:00	1 2 3 4 5 6 7	19:20			

VOLOS-VYZITSA			VYZITSA-VOLOS		
Departure	Day	Arrival	Departure	Day	Arrival
5:45	1 2 3 4 5	7:05	7:00	1 2 3 4 5	8:20
6:30	1 2 3 4 5	7:50	8:15	1 2 3 4 5 6 7	9:35
7:00		6 7 8:20	10:15	1 2 3 4 5	11:35
9:15		6 7 10:35	10:30		6 7 11:50
12:00	1 2 3 4 5	13:20	13:45	1 2 3 4 5	15:05
13:15		6 7 14:35	14:30	1 2 3 4 5 6 7	15:50
13:30	1 2 3 4 5	14:50	19:15	1 2 3 4 5 6 7	20:35
18:00	1 2 3 4 5 6 7	19:20			

VOLOS-AFISSOS			AFISSOS-VOLOS		
Departure	Day	Arrival	Departure	Day	Arrival
5:15	1 2 3 4 5	6:15	7:10	1 2 3 4 5	8:10
6:00		6 7:00	8:00		6 9:00
11:00	1 2 3 4 5	12:00	12:00	1 2 3 4 5	13:00
12:30	1 2 3 4 5	13:30	14:15	1 2 3 4 5	15:15
14:00	1 2 3 4 5 6 7	15:00	15:00	1 2 3 4 5 6 7	16:00
16:30	1 2 3 4 5 6 7	17:30	18:20	1 2 3 4 5 6 7	19:20
21:00	1 2 3 4 5 6 7	22:00	22:00	1 2 3 4 5 6 7	23:00

VOLOS-MILINA			MILINA-VOLOS		
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Departure	Day	Arrival	Departure	Day	Arrival
4:00	1 2 3 4 5	5:45	7:30	1 2 3 4 5	9:15
5:15	6	7:00	9:00	6	10:45
10:15	1 2 3 4 5 6 7	12:00	14:45	1 2 3 4 5 6	16:30
12:30	1 2 3 4 5 6	14:15	16:00	1 2 3 4 5 6 7	17:45
14:30	1 2 3 4 5 7	16:15	18:30	1 2 3 4 5 7	20:15
16:30	1 2 3 4 5 6 7	18:15	19:15	1 2 3 4 5 6 7	21:00

VOLOS-NEOCHORI			NEOCHORI-VOLOS		
Departure	Day	Arrival	Departure	Day	Arrival
5:15	1 2 3 4 5	6:55	6:55	1 2 3 4 5	8:35
6:00	6	7:40	7:45	6	9:25
8:30	1 2 3 4 5 6 7	10:10	14:00	1 2 3 4 5	15:40
12:30	1 2 3 4 5	14:10	15:15	1 2 3 4 5 6 7	16:55
13:30	1 2 3 4 5 6 7	15:10	17:45	1 2 3 4 5 6 7	19:25
16:30	1 2 3 4 5 6 7	18:10			

VOLOS-TRIKERI			TRIKERI-VOLOS		
Departure	Day	Arrival	Departure	Day	Arrival
4:00	1 2 3 4 5	6:45	7:00	1 2 3 4 5	9:45
5:15	6	8:00	8:30	6	11:15
14:30	1 2 3 4 5 7	17:15	18:00	1 2 3 4 5 7	20:45

VOLOS-PLATANIAS			PLATANIAS-VOLOS		
Departure	Day	Arrival	Departure	Day	Arrival
5:15	1 2 3 4 5	7:45	7:15	1 2 3 4 5	9:45
10:15	6 7	12:45	14:45	1 2 3 4 5 6 7	17:15
12:30	1 2 3 4 5	15:00	18:45	1 2 3 4 5 6 7	21:15
16:30	1 2 3 4 5 6 7	19:00			

VOLOS-KATIGIORGIS			KATIGIORGIS-VOLOS		
Departure	Day	Arrival	Departure	Day	Arrival
4:15	1 2 3 4 5	7:05	6:30	1 2 3 4 5	9:20
10:15	6 7	13:05	15:15	1 2 3 4 5 6 7	18:05
12:30	1 2 3 4 5	15:20			

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VOLOS-KASTORIA								KASTORIA-VOLOS									
Departure							Arrival	Departure							Arrival		
Day								Day									
7:15	1	2	3	4	5	6	7	11:15	14:15	1	2	3	4	5	6	7	18:15
14:30					5		7	18:30									

VOLOS-AGRINIO								AGRINIO-VOLOS									
Departure							Arrival	Departure							Arrival		
Day								Day									
14:15	1	2	3	4	5	6	7	20:15	8:45	1	2	3	4	5	6	7	14:45
19:45					5		7	1:45	16:00					5		7	22:00

VOLOS-IOANNINA								IOANNINA-VOLOS									
Departure							Arrival	Departure							Arrival		
Day								Day									
8:00	1	2	3	4	5	6	7	12:30	10:15	1	2	3	4	5	6	7	14:45
13:30	1	2	3	4	5	6	7	18:00	15:00	1	2	3	4	5	6	7	19:30
17:30	1	2	3	4	5		7	22:00	20:00	1	2	3	4	5		7	0:30

Table 231: Departures from Volos

Below, Didymoticho destination current departure time is presented (table 232).

DIDYMOTIC HO-KAVALA								KAVALA-DIDYMOTIC HO									
Departure							Arrival	Departure							Arrival		
Day								Day									
6:05	1	2	3	4	5	6	7	10:05	10:00	1	2	3	4	5	6	7	14:00
9:20	1	2	3	4	5	6	7	13:20	13:15	1	2	3	4	5	6	7	17:15
11:50	1	2	3	4	5	6	7	15:50	16:45	1	2	3	4	5	6	7	20:45
14:50	1	2	3	4	5	6	7	18:50	20:30	1	2	3	4	5	6	7	0:30
16:50	1	2	3	4	5	6	7	20:50	1:45	1	2	3	4	5	6	7	5:45
20:05	1	2	3	4	5	6	7	1:05									

Table 232: Departures from Didymoticho

Below, Thiva destinations current departure time is presented (table 233).

THIVA-DOMVRAINIA								DOMVRAINIA-THIVA										
Departure							Arrival	Departure							Arrival			
Day								Day										
10:00	1	2	3	4	5			11:00	7:00	1	2	3	4	5	6			8:00

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10:30						6	7	11:30		9:40	1	2	3	4	5	6	10:40	
12:30	1	2	3	4	5	6		13:30		11:55	1	2	3	4	5	6	7	12:55
14:30	1	2	3	4	5	6	7	15:30		18:50	1	2	3	4	5	6	7	19:50
17:30	1	2	3	4	5	6		18:30										

THIVA-THESPIES									THESPIES-THIVA								
								Arriv									Arriv
Departure	Day							al	Departure	Day							al
7:45	1	2	3	4	5			8:10	6:30	1	2	3	4	5			6:55
10:00	1	2	3	4	5			10:25	7:10	1	2	3	4	5			7:35
10:30						6	7	10:55	7:30	1	2	3	4	5	6	7	7:55
11:30	1	2	3	4	5			11:55	8:30	1	2	3	4	5			8:55
12:30	1	2	3	4	5	6		12:55	9:20	1	2	3	4	5	6		9:45
13:30	1	2	3	4	5	6	7	13:55	10:10	1	2	3	4	5	6		10:35
14:30	1	2	3	4	5	6		14:55	12:20	1	3	3	4	5	6	7	12:45
16:00	1	2	3	4	5	6		16:25	15:10	1	2	3	4	5			15:35
17:30	1	2	3	4	5	6		17:55	16:10						6	7	16:35
20:30	1	2	3	4	5	6	7	20:55	19:15	1	2	3	4	5	6	7	19:40

THIVA-ASOPIA									ASOPIA-THIVA								
								Arriv									Arriv
Departure	Day							al	Departure	Day							al
6:00	1	2	3	4	5			6:25	7:20	1	2	3	4	5			7:45
12:15	1	2	3	4	5			12:40	8:30	1	2	3	4	5	6		8:55
14:15	1	2	3	4	5	6		14:40	15:30	1	2	3	4	5	6		15:55
14:30							7	14:55									

THIVA-MAVROMATI									MAVROMATI-THIVA								
								Arriv									Arriv
Departure	Day							al	Departure	Day							al
7:45	1	2	3	4	5			8:15	6:10	1	2	3	4	5			6:40
11:30	1	2	3	4	5			12:00	9:15								9:45
14:30	1	2	3	4	5	6		15:00	15:00	1	2	3	4	5			15:30
20:30	1	2	3	4	5	6	7	21:00	16:00						6	7	16:30

THIVA-PANAGIA									PANAGIA-THIVA								
								Arriv									Arriv
Departure	Day							al	Departure	Day							al
11:30	1	2	3	4	5			12:05	7:00	1	2	3	4	5			7:35
12:30	1	2	3	4	5			13:05	9:00								9:35
14:30	1	2	3	4	5	6		15:05	15:00	1	2	3	4	5			15:35

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20:30	1	2	3	4	5	6	7	21:05	16:00	6	7	16:35
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THIVA-KSIRONOMI									KSIRONOMI-THIVA									
Departure								Arrival	Departure								Arrival	
Day									Day									
10:00	1	2	3	4	5			10:50	7:10	1	2	3	4	5	6			7:00
10:30						6	7	11:20	9:45	1	2	3	4	5	6			10:35
12:35	1	2	3	4	5	6		13:25	12:05	1	2	3	4	5	6	7		12:55
14:30	1	2	3	4	5	6	7	15:20	19:00	1	2	3	4	5	6	7		19:50
17:30						6		18:20										

THIVA-LEFKTRA									LEFKTRA-THIVA								
Departure								Arrival	Departure								Arrival
Day									Day								
11:30	1	2	3	4	5	6		12:00	7:15	1	2	3	4	5			7:45
14:10	1	2	3	4	5	6		14:40	8:00						6		8:30
16:00	1	2	3	4	5			16:30	11:45	1	2	3	4	5	6		12:15
20:00	1	2	3	4	5			20:30	16:25	1	2	3	4	5			16:55

THIVA-KAPARELI									KAPARELI-THIVA								
Departure								Arrival	Departure								Arrival
Day									Day								
11:30	1	2	3	4	5	6		12:00	7:15	1	2	3	4	5			7:45
14:10	1	2	3	4	5	6		14:40	8:00						6		8:30
16:00	1	2	3	4	5			16:30	11:30	1	2	3	4	5	6		12:00
20:00	1	2	3	4	5			20:30	16:20	1	2	3	4	5			16:50

THIVA-ERYTHRES									ERYTHRES-THIVA								
Departure								Arrival	Departure								Arrival
Day									Day								
7:00	1	2	3	4	5			7:15	7:35	1	2	3	4	5			7:50
10:30	1	2	3	4	5			10:45	9:00	1	2	3	4	5	6		9:15
12:30	1	2	3	4	5			12:45	11:15	1	2	3	4	5			11:30
14:10	1	2	3	4	5	6		14:25									
20:00	1	2	3	4	5			20:15									

THIVA-PLATAIES									PLATAIES-THIVA								
Departure								Arrival	Departure								Arrival
Day									Day								

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10:30	1 2 3 4 5	10:50	7:30	1 2 3 4 5	7:50
14:10	1 2 3 4 5 6	14:30	8:50	1 2 3 4 5 6	8:10
20:00	1 2 3 4 5	20:20	10:50	1 2 3 4 5	11:10

THIVA-NEOCHORAKI			NEOCHORAKI-THIVA		
Departure	Day	Arrival	Departure	Day	Arrival
6:00	1 2 3 4 5	6:10	7:30	1 2 3 4 5	7:40
12:15	1 2 3 4 5	12:25	8:45	1 2 3 4 5 6	8:55
14:15	1 2 3 4 5 6	14:25	15:45	1 2 3 4 5 6	15:55
14:30		7 14:40			

THIVA-KALLITHEA			KALLITHEA-THIVA		
Departure	Day	Arrival	Departure	Day	Arrival
6:00	1 2 3 4 5	6:20	7:25		7:45
12:15	1 2 3 4 5	12:35	8:40	1 2 3 4 5 6	9:00
14:15	1 2 3 4 5 6	14:35	15:40	1 2 3 4 5 6	16:00
14:30		7 14:50			

THIVA-LEONTARI			LEONTARI-THIVA		
Departure	Day	Arrival	Departure	Day	Arrival
7:45	1 2 3 4 5	8:10	6:35	1 2 3 4 5	7:00
10:00	1 2 3 4 5	10:25	7:10	1 2 3 4 5	7:35
10:30		6 7 10:55	7:30	1 2 3 4 5 6	7:55
11:30	1 2 3 4 5	11:55	8:30	1 2 3 4 5	8:55
12:30	1 2 3 4 5 6	12:55	9:20	1 2 3 4 5 6	9:45
14:30	1 2 3 4 5 6	14:55	10:10	1 2 3 4 5 6	10:35
16:00	1 2 3 4 5	16:25	12:20	1 2 3 4 5 6 7	12:45
17:30	1 2 3 4 5 6	17:55	15:10	1 2 3 4 5	15:35
20:30	1 2 3 4 5 6 7	20:55	16:10		6 7 16:35
			16:30	1 2 3 4 5	16:55
			19:30	1 2 3 4 5 6 7	19:55

THIVA-ARMA			ARMA-THIVA		
Departure	Day	Arrival	Departure	Day	Arrival
12:55	1 2 3 4 5	13:20	8:10	1 2 3 4 5	8:35

THIVA-			DERVENOCHOR		
--------	--	--	-------------	--	--

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DERVENOCHORIA						IA-THIVA									
Departure					Day	Arrival	Departure					Day	Arrival		
7:00	1	2	3	4	5		8:10	8:15	1	2	3	4	5		9:25
12:30	1	2	3	4	5		13:40	13:30	1	2	3	4	5		14:40

THIVA-PLATANAKI						PLATANAKI-THIVA									
Departure					Day	Arrival	Departure					Day	Arrival		
7:00	1	2	3	4	5	6	7:30	7:15	1	2	3	4	5		7:45
14:10	1	2	3	4	5		14:40		1	2	3	4	5		

THIVA-N.KOKKINO						N. KOKKINO-THIVA									
Departure					Day	Arrival	Departure					Day	Arrival		
6:30	1	2	3	4	5		7:10	7:20	1	2	3	4	5		8:00
11:00	1		3		5		11:40	11:40	1		3		5		12:20
14:15	1	2	3	4	5		14:55	15:45	1	2	3	4	5		16:25

THIVA-SARANTI						SARANTI-THIVA											
Departure					Day	Arrival	Departure					Day	Arrival				
12:30	1	2	3	4	5		13:40	7:30	1	2	3	4	5		8:40		
14:30	1	2	3	4	5	6	7	15:40	18:30	1	2	3	4	5	6	7	19:40

Table 233: Departures from Thiva

Below, Lamia destinations current departure time is presented (table 234).

LAMIA-KARPENISI						KARPENISI-LAMIA											
Departure					Day	Arrival	Departure					Day	Arrival				
10:45	1	2	3	4	5	6	7	12:15	6:30	1	2	3	4	5	6	8:00	
13:30	1	2	3	4	5	6		15:00	9:00	1	2	3	4	5	6	7	10:30
20:00	1	2	3	4	5	6	7	21:30	16:30	1	2	3	4	5	6	7	18:00

LAMIA-FOURNA						FOURNA-LAMIA									
Departure					Day	Arrival	Departure					Day	Arrival		
5:45	1						8:45	12:45	1						15:45

Table 234: Departures from Lamia

Below, Patra destinations current departure time is presented (table 235).

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PATRA-AGRINIO							AGRINIO-PATRA										
Departure	Day						Arrival	Departure	Day						Arrival		
6:00	1	2	3	4	5		7:30	4:00	1	2	3	4	5		5:30		
7:15	1	2	3	4	5		8:45	5:15	1	2	3	4	5		6:45		
7:30						6	9:00	6:45						6	8:15		
9:00						7	10:30	7:00	1				5		8:30		
9:30	1	2	3	4	5	6	11:00	9:10	1	2	3	4	5	6	7	10:40	
12:00	1	2	3	4	5	6	7	13:30	10:30	1	2	3	4	5		12:00	
14:00	1				5	6	15:30	12:00						6	7	13:30	
15:00						6	7	16:30	12:30	1	2	3	4	5		14:00	
15:30	1	2	3	4	5		17:00	14:00	1	2	3	4	5	6	7	15:30	
17:00	1	2	3	4	5	6	7	18:30	16:00	1	2	3	4	5	6	7	17:30
19:00	1	2	3	4	5	6	7	20:30	19:00	1	2	3	4	5	6	7	20:30
21:00	1	2	3	4	5	6	7	22:30									

PATRA-MESOLOGGI							MESOLOGGI-I-PATRA										
Departure	Day						Arrival	Departure	Day						Arrival		
6:00	1	2	3	4	5		6:40	4:50	1	2	3	4	5		5:30		
7:15	1	2	3	4	5		7:55	5:45	1	2	3	4	5		6:25		
7:30	1	2	3	4	5	6	8:10	7:15						6	7:55		
9:00						7	9:40	9:00	1	2	3	4	5		9:40		
9:30	1	2	3	4	5	6	10:10	9:30						7	10:10		
11:50	1	2	3	4	5		12:30	9:40						6	10:20		
12:00						6	7	12:40	11:00	1	2	3	4	5		11:40	
14:00	1	2	3	4	5	6	14:40	12:30						6	7	13:10	
15:00						6	7	15:40	13:00	1	2	3	4	5		13:40	
15:30	1	2	3	4	5		16:10	14:30	1	2	3	4	5	6	7	15:10	
17:00	1	2	3	4	5	6	7	17:40	16:30	1	2	3	4	5	6	7	17:10
19:00	1	2	3	4	5	6	7	19:40	19:30	1	2	3	4	5	6	7	20:10
21:00	1	2	3	4	5	6	7	21:40									

PATRA-PYRGOS							PYRGOS-PATRA										
Departure	Day						Arrival	Departure	Day						Arrival		
5:30	1	2	3	4	5		6:45	5:30	1	2	3	4	5		6:45		
6:45	1	2	3	4	5	6	7	8:00	7:30	1	2	3	4	5	6	7	8:45
9:30	1	2	3	4	5	6	7	10:45	8:15	1	2	3	4	5	6		9:30
11:00	1	2	3	4	5	6	7	12:15	9:45	1	2	3	4	5	6	7	11:00

12:30	1 2 3 4 5 6	13:45	11:15	1 2 3 4 5 6 7	12:30
13:45	1 2 3 4 5 6 7	15:00	13:30	1 2 3 4 5 6 7	14:45
15:00	1 2 3 4 5 6 7	16:15	15:00	1 2 3 4 5 6 7	16:15
17:00	1 2 3 4 5 6 7	17:15	17:15	1 2 3 4 5 6 7	18:30
18:40	1 2 3 4 5 6 7	19:55	18:00	1 2 3 4 5 6 7	19:15
20:40	1 2 3 4 5 6 7	21:55	20:00	1 2 3 4 5 6 7	21:15

Table 235: Departures from Patra

Appendix B: Code used for optimization

Below, an example of one route is presented. It is for train optimization, Athens-Lianokladi route and 90 minute window version.

```
//----- TRAIN OPTIMIZATION (Athens-Thiva-
Lianokladi) -----
#include <ilcplex/ilocplex.h>
ILOSTLBEGIN

    int*** create3DArray(int imax, int jmax, int kmax)
{
    int*** arr = new int**[imax];
    for(int i=0;i<imax;i++)
    {
        arr[i] = new int*[jmax];
        for(int j=0;j<jmax;j++){
            arr[i][j] = new int[kmax];
        }
    }
    return arr;
}

    int** create2DArray(int imax, int jmax)
{
    int** arr = new int*[imax];
    for(int i=0;i<imax;i++)
    {
        arr[i] = new int[jmax];
    }
    return arr;
}
```

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```

int main (int argc, char **argv)
{

int i,j,m,n,k,r,s,t;
const int imax=43; //komvoi eite OSE eite KTEL
const int jmax=43; //-----//-----
const int kmax=3; //---komvoi OSE-----
const int mmax=86; //aukson arithmos dromologiou
const int nmax=86; //-----//-----
const int rmax=86; //-----//-----
const int tmax=2; //aukson arithmos syndesis, perigrafetai kalytera parakatw

const long BigM=1000000;
const long MeanM=10000;

double SmallM=0.00001;

int* T2K=new int[kmax]; //xronos metavasis
apo OSE se KTEL se poli pou diathetei kai ta dyo
int*** K=create3DArray(imax,jmax,mmax); //xronos taksidiou apo i se j

int*** ST=create3DArray(imax,jmax,mmax); //noriteri ora anaxorisis
int*** ET=create3DArray(imax,jmax,mmax); //argoteri ora anaxorisis

int** Route=create2DArray(imax,jmax); //arithmos dromologion apo i se j
mesa se mia mera
int** H = create2DArray(imax,jmax); //1 an i kai j syndeontai,
0 an oxi

int** X=create2DArray(imax,jmax); //paromoio me to H,
xrhsimopieitai mazi me to apanw san if conditions
int* T=new int[imax]; //1 an yparxei
stathmos OSE sto i, 0 an oxi
int**L=create2DArray(imax,jmax);
int** G=create2DArray(imax,jmax); //Set apo ton prwto kai deutero
stathmo OSE kathe grammis ose, gia gap constraint
int*** O = create3DArray(imax,jmax,tmax); //1 an ta i kai j einai diadoxikoi komvoi
kapias grammis ose, 0 an oxi

////=====
////=====PINAKAS Oijt gia poleis me OSE=====
////=====

for (i=0;i<imax;i++){
    for(j=0;j<jmax;j++){
        for(t=0;t<tmax;t++){
            O[i][j][t]=0;
        }
    }
}

O[0][1][0]=1;
O[1][2][1]=1;

O[2][1][0]=1;
O[1][0][1]=1;

```

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```

//
//
//cout << "Oijt inserted" << endl;
system ("pause");
//

//=====
/////=====Kataxwrhsh timwn sta T[i]=====////////
//=====
for (i=0;i<imax;i++){
    T[i]=0;
}

T[0]=1;
T[1]=1;
T[2]=1;

cout << "Ti inserted" << endl;
system ("pause");

//=====
=
/////=====Kataxwrhsh timwn sta L[i][j]=====////////
//=====
=

for (i=0;i<imax;i++){
    for(j=0;j<jmax;j++){
        L[i][j]=0;
    }
}

for (i=0;i<imax;i++){
    for(j=0;j<jmax;j++){
        if((T[i]+T[j]==0))
            L[i][j]=1;
    }
}

for (i=0;i<imax;i++){
    for(j=0;j<jmax;j++){
        if(T[i]+T[j]==2)
            L[i][j]=1;
    }
}

//=====
=
/////=====Kataxwrhsh timwn sta H[i][j]=====////////
//=====
=

```

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```
for (i=0;i<imax;i++){  
    for(j=0;j<jmax;j++){  
        H[i][j]=0;  
    }  
}
```

```
H[0][3]=1;  
H[0][4]=1;  
H[0][5]=1;  
H[0][6]=1;  
H[0][7]=1;  
H[0][8]=1;  
H[0][9]=1;  
H[0][10]=1;  
H[0][11]=1;  
H[0][12]=1;  
H[0][13]=1;  
H[0][14]=1;  
H[0][15]=1;  
H[0][16]=1;  
H[0][17]=1;  
H[0][18]=1;  
H[0][19]=1;  
H[0][20]=1;  
H[0][21]=1;  
H[0][22]=1;  
H[0][23]=1;  
H[0][24]=1;  
H[3][0]=1;  
H[4][0]=1;  
H[5][0]=1;  
H[6][0]=1;  
H[7][0]=1;  
H[8][0]=1;  
H[9][0]=1;  
H[10][0]=1;  
H[11][0]=1;  
H[12][0]=1;  
H[13][0]=1;  
H[14][0]=1;  
H[15][0]=1;  
H[16][0]=1;  
H[17][0]=1;  
H[18][0]=1;  
H[19][0]=1;  
H[20][0]=1;  
H[21][0]=1;  
H[22][0]=1;  
H[23][0]=1;  
H[24][0]=1;  
H[1][25]=1;  
H[1][26]=1;  
H[1][27]=1;  
H[1][28]=1;  
H[1][29]=1;  
H[1][30]=1;  
H[1][31]=1;  
H[1][32]=1;  
H[1][33]=1;  
H[1][34]=1;  
H[1][35]=1;  
H[1][36]=1;
```

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```

H[1][37]=1;
H[1][38]=1;
H[1][39]=1;
H[1][40]=1;
H[1][41]=1;
H[1][42]=1;
H[25][1]=1;
H[26][1]=1;
H[27][1]=1;
H[28][1]=1;
H[29][1]=1;
H[30][1]=1;
H[31][1]=1;
H[32][1]=1;
H[33][1]=1;
H[34][1]=1;
H[35][1]=1;
H[36][1]=1;
H[37][1]=1;
H[38][1]=1;
H[39][1]=1;
H[40][1]=1;
H[41][1]=1;
H[42][1]=1;

//-----Hij trainwn-----
-----
H[0][1]=1;
H[1][2]=1;
H[2][1]=1;
H[1][0]=1;

/////=====
==
/////=====Kataxwrhsh timwn sta X[i][j]=====////////
////=====

for (i=0;i<imax;i++){
    for(j=0;j<jmax;j++){
        X[i][j]=max(H[i][j],H[j][i]);
    }
}

/////=====
=
/////=====Kataxwrhsh timwn sta T2K[k]=====////////
////=====
=

for (k=0;k<kmax;k++){
    T2K[k]=15;
}

```

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```
//////=====
=
//////=====Kataxwrhsh timwn sta Route[i][j]=====///
//////=====
=

for (i=0;i<imax;i++){
    for (j=0;j<jmax;j++){
        Route[i][j]=0;
    }
}

//-----ROUTE IJ GIA TA TRENA-----

//-----athina-lianokladi-----

Route[0][1]=3;
Route[1][2]=3;
//-----lianokladi-athina-----

Route[1][0]=3;
Route[2][1]=3;

//=====ROUTES KTEL ME DIPLTOTYPA=====

Route[0][3]=85;
Route[0][4]=21;
Route[0][5]=7;
Route[0][6]=63;
Route[0][7]=21;
Route[0][8]=40;
Route[0][9]=21;
Route[0][10]=35;
Route[0][11]=56;
Route[0][12]=27;
Route[0][13]=21;
Route[0][14]=83;
Route[0][15]=7;
Route[0][16]=14;
Route[0][17]=7;
Route[0][18]=28;
Route[0][19]=86;
Route[0][20]=52;
Route[0][21]=15;
Route[0][22]=3;
Route[0][23]=38;
Route[0][24]=62;
Route[3][0]=80;
Route[4][0]=34;
Route[5][0]=17;
Route[6][0]=61;
Route[7][0]=21;
Route[8][0]=30;
Route[9][0]=21;
Route[10][0]=42;
Route[11][0]=49;
```

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```

Route[12][0]=27;
Route[13][0]=21;
Route[14][0]=83;
Route[15][0]=7;
Route[16][0]=7;
Route[17][0]=7;
Route[18][0]=29;
Route[19][0]=85;
Route[20][0]=65;
Route[21][0]=20;
Route[22][0]=7;
Route[23][0]=75;
Route[24][0]=69;
Route[1][25]=26;
Route[1][26]=54;
Route[1][27]=17;
Route[1][28]=23;
Route[1][29]=23;
Route[1][30]=21;
Route[1][31]=22;
Route[1][32]=22;
Route[1][33]=26;
Route[1][34]=16;
Route[1][35]=17;
Route[1][36]=17;
Route[1][37]=47;
Route[1][38]=5;
Route[1][39]=10;
Route[1][40]=11;
Route[1][41]=13;
Route[1][42]=12;
Route[25][1]=26;
Route[26][1]=55;
Route[27][1]=17;
Route[28][1]=12;
Route[29][1]=12;
Route[30][1]=26;
Route[31][1]=17;
Route[32][1]=17;
Route[33][1]=16;
Route[34][1]=16;
Route[35][1]=17;
Route[36][1]=12;
Route[37][1]=59;
Route[38][1]=5;
Route[39][1]=10;
Route[40][1]=5;
Route[41][1]=13;
Route[42][1]=12;

//=====
////=====Kataxwrhsh timwn sta G[i][j]=====////////
///=====

for (i=0;i<imax;i++){
    for (j=0;j<jmax;j++){
        G[i][j]=0;
    }
}

G[0][1]=1;
G[2][1]=1;

```

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```

cout << "Gij inserted" << endl;
system ("pause");

//===Kataxwrhsh timwn sta
K[i][j][m]=====////////
//===

for (i=0;i<imax;i++){
    for(j=0;j<jmax;j++){
        for(m=0;m<mmax;m++){
            K[i][j][m]=0;
        }
    }
}

//Kijm
K[0][1][0]=64;
K[0][1][1]=64;
K[0][1][2]=64;
K[1][2][0]=100;
K[1][2][1]=101;
K[1][2][2]=100;
K[2][1][0]=96;
K[2][1][1]=96;
K[2][1][2]=96;
K[1][0][0]=63;
K[1][0][1]=64;
K[1][0][2]=64;

//===Kataxwrhsh timwn sta
ET[i][j][m]=====////////
//===

for (i=0;i<imax;i++){
    for(j=0;j<jmax;j++){
        for(m=0;m<mmax;m++){
            ET[i][j][m]=0;
        }
    }
}

//===Kataxwrhsh timwn sta
ST[i][j][m]=====////////
//===

for (i=0;i<imax;i++){
    for(j=0;j<jmax;j++){
        for(m=0;m<mmax;m++){
            ST[i][j][m]=0;
        }
    }
}

```



```

//
////-----DIAVASMA ARXEION GO-----
//

ifstream infile_1;
infile_1.open("C0jm.txt");
for (int j=0;j<jmax;j++) {
    for(int m=0;m<mmax;m++){
        infile_1 >> ST[0][j][m];
    }
}
infile_1.close();

ifstream infile_932;
infile_932.open("C1jm.txt");
for (int j=0;j<jmax;j++) {
    for(int m=0;m<mmax;m++){
        infile_932 >> ST[1][j][m];
    }
}
infile_932.close();

ifstream infile_2;
infile_2.open("C2jm.txt");
for (int j=0;j<jmax;j++) {
    for(int m=0;m<mmax;m++){
        infile_2 >> ST[2][j][m];
    }
}
infile_2.close();

cout << " infiles red " << endl;
system ("pause");

//-----infile return-----

ifstream infile_36;
infile_36.open("Ci0m.txt");
for (int i=0;i<imax;i++) {
    for(int m=0;m<mmax;m++){
        infile_36 >> ST[i][0][m];
    }
}
infile_36.close();

ifstream infile_37;
infile_37.open("Ci2m.txt");
for (int i=0;i<imax;i++) {
    for(int m=0;m<mmax;m++){

```

```

        infile_37 >> ST[i][2][m];
    }
infile_37.close();

ifstream infile_933;
infile_933.open("Ci1m.txt");
for (int i=0;i<imax;i++) {
    for(int m=0;m<mmax;m++){
        infile_933 >> ST[i][1][m];
    }
}
infile_933.close();

//=====infile telos=====

////===== Case 1: dedomena dromologiwn KTEL =====

for (i=0;i<imax;i++){
    for(j=0;j<jmax;j++){
        for(m=0;m<mmax;m++){
            if(m<Route[i][j]){
                if((X[i][j]==1)&&(T[i]+T[j]==1)){
                    ET[i][j][m]=ST[i][j][m];
                }
            }
        }
    }
}

//////===== Case 2: dedomena dromologiwn OSE =====

for (i=0;i<imax;i++){
    for(j=0;j<jmax;j++){
        for(m=0;m<mmax;m++){
            if(m<Route[i][j]){
                //if ((T[i]==0)&&(T[j]==1))||((T[i]=1)&&(T[j]==0))){
                if ((X[i][j]==1)&&(T[i]+T[j]==2)) {
                    ET[i][j][m]=15000;
                }
            }
        }
    }
}

//STijm (lower bound)
ST[0][1][0]=6438-45;
ST[0][1][1]=6917-45;
ST[0][1][2]=9318-45;
ST[1][2][0]=6502-45;
ST[1][2][1]=6981-45;
ST[1][2][2]=9382-45;
ST[2][1][0]=409-45;

```

```

ST[2][1][1]=6762-45;
ST[2][1][2]=9642-45;
ST[1][0][0]=505-45;
ST[1][0][1]=6858-45;
ST[1][0][2]=9738-45;

//ETijm (upper bound)
ET[0][1][0]=6438+45;
ET[0][1][1]=6917+45;
ET[0][1][2]=9318+45;
ET[1][2][0]=6502+45;
ET[1][2][1]=6981+45;
ET[1][2][2]=9382+45;
ET[2][1][0]=409+45;
ET[2][1][1]=6762+45;
ET[2][1][2]=9642+45;
ET[1][0][0]=505+45;
ET[1][0][1]=6858+45;
ET[1][0][2]=9738+45;

//----- CPLEX OPTIMIZATION -----
-----
    IloEnv env;

    try {

        IloModel model (env);

typedef IloArray<IloNumArray> IloNumMatrix2x2;
typedef IloArray<IloNumMatrix2x2> IloNumMatrix3x3;
typedef IloArray<IloNumMatrix3x3> IloNumMatrix4x4;
typedef IloArray<IloNumMatrix4x4> IloNumMatrix5x5;

typedef IloArray<IloNumVarArray> IloNumVarMatrix2x2;
typedef IloArray<IloNumVarMatrix2x2> IloNumVarMatrix3x3;
typedef IloArray<IloNumVarMatrix3x3> IloNumVarMatrix4x4;
typedef IloArray<IloNumVarMatrix4x4> IloNumVarMatrix5x5;

typedef IloArray<IloRangeArray> IloRangeMatrix2x2;
typedef IloArray<IloRangeMatrix2x2> IloRangeMatrix3x3;
typedef IloArray<IloRangeMatrix3x3> IloRangeMatrix4x4;
typedef IloArray<IloRangeMatrix4x4> IloRangeMatrix5x5;

IloCplex cplex(env);

//----- Decision Variable LT (=Train Departure time) -----
-----

IloNumVarMatrix3x3 LTijr(env,0);
for(i=0;i<imax;i++){
    IloNumVarMatrix2x2 LTjr(env,0);
    for(j=0;j<jmax;j++){
        IloNumVarArray LTr(env,0);
        for (r=0;r<Route[i][j];r++){
            char Leaving_Time[70];
            sprintf(Leaving_Time,"LTijr(%d,%d,r%d)",i,j,r);

```

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```

        IloNumVar
LT(env,ST[i][j][r],ET[i][j][r],ILOFLOAT,Leaving_Time);
        LTr.add(LT);

    }
    LTjr.add(LTr);

}
LTijr.add(LTjr);
}
cout << "LTijr decision variable for departure time of train stated " << endl;
system ("pause");

//----- Decision Variable Y (Binary) -----
---

IloNumVarMatrix5x5 Yikjmn(env,0);
for(i=0;i<imax;i++){
    IloNumVarMatrix4x4 Ykjmn(env,0);
    for(k=0;k<kmax;k++){
        //if(X[i][k]==1){
        IloNumVarMatrix3x3 Yjmn(env,0);
        for(j=0;j<jmax;j++){
            //if(X[i][j]==0){
            //if((X[k][j]==1)&&(X[i][j]==0)&&(L[i][j]==0)&&(i!=j)){
            IloNumVarMatrix2x2 Ymn(env,0);
            for (m=0;m<Route[i][k];m++){
                //if(m<Route[i][k]){
                IloNumVarArray Yn(env,0);
                for (n=0;n<Route[k][j];n++){
                    //if ((n<Route[k][j])){
                    char Binary_Y[70];

                    sprintf(Binary_Y, "Yikjmn(%d,%d,%d,%d,%d)",i,k,j,m,n);
                    IloNumVar Y(env,0,1,ILOINT,Binary_Y);

                    Yn.add(Y);

                    //}

                }
                Ymn.add(Yn);

            //}
            }
            Yjmn.add(Ymn);

        //}
        //}
        }
        Ykjmn.add(Yjmn);
    // }
    }
    Yikjmn.add(Ykjmn);
}
cout << "Binary decision variable Yikjmn stated" << endl;
system ("pause");

//----- Decision Variable WT (Waiting time)-----
-----

```

```

IloNumVarMatrix5x5 WTikjmn(env,0);
for(i=0;i<imax;i++){
    IloNumVarMatrix4x4 WTKjmn(env,0);
    for(k=0;k<kmax;k++){
        //if(X[i][k]==1){

            IloNumVarMatrix3x3 WTjmn(env,0);
            for(j=0;j<jmax;j++){
                //if(X[i][j]==0){
                //if((X[k][j]==1)&&(X[i][j]==0)&&(L[i][j]==0)&&(i!=j)){
                IloNumVarMatrix2x2 WTMn(env,0);
                for (m=0;m<Route[i][k];m++){
                    //if(m<Route[i][k]){
                    IloNumVarArray WTn(env,0);
                    for (n=0;n<Route[k][j];n++){
                        //if (n<Route[k][j]){
                            char Waiting_Time[70];

                            sprintf(Waiting_Time,"WTikjmn(i%d,k%d,j%d,m%d,n%d)",i,k,j,m,n);
                                IloNumVar
                                WT(env,0,100000,ILOFLOAT,Waiting_Time);
                                    WTn.add(WT);
                                        //}
                                            }
                                                WTMn.add(WTn);
                                                    //}
                                                        }
                                                            WTKjmn.add(WTMn);
                                                                //}
                                                                    }
                                                                        //}
                                                                            WTKjmn.add(WTKjmn);
                                                                                }
                                                                                    cout << "Decision variable WTikjmn stated " << endl;
                                                                                        system("pause");

//-----
//-----CONSTRAINTS-----
//-----

//-----
//----- WAITING TIME (1) -----
//-----

IloRangeMatrix4x4 WAIT_Aikjm(env,0);
for(i=0;i<imax;i++){
    IloRangeMatrix3x3 WAIT_Akjm(env,0);
    for(k=0;k<kmax;k++){
        IloRangeMatrix2x2 WAIT_Ajm(env,0);
        for (j=0;j<jmax;j++){

            if ((X[i][k]==1)&&(X[k][j]==1)&&(X[i][j]==0)){

                if ((L[i][j]==0)&&(i!=j)){

```

```

IloRangeArray WAIT_Am(env,0);
for(m=0;m<Route[i][k];m++){
    IloExpr expr(env,0);

    expr += LTijr[k][j][0]- LTijr[i][k][m]-
K[i][k][m] - T2K[k] - WTikjmn[i][k][j][m][0];

    // to "- BigM*(2 - X[i][k] - X[k][j] + X[i][j])" exei
mpei ws if condition metaksy twv for//

    char Waiting_Time_A[60];

    sprintf(Waiting_Time_A,"WAIT_Aikjm(i%d,k%d,j%d,m%d)",i,k,j,m);
    float LB=-IloInfinity,UB=0;
    IloRange WAIT_A(env, LB,expr,UB,Waiting_Time_A);
    expr.end();
    model.add(WAIT_A);
    WAIT_Am.add(WAIT_A);
}
WAIT_Ajm.add(WAIT_Am);
}
WAIT_Akjm.add(WAIT_Ajm);
}

}
WAIT_Aikjm.add(WAIT_Akjm);
}

cout<<"1st constraint stated";
system ("pause");

//-----
//----- WAITING TIME (2) -----
//-----

IloRangeMatrix5x5 WAIT1_Bikjmn(env,0);
for(i=0;i<imax;i++){
    IloRangeMatrix4x4 WAIT1_Bkjmn(env,0);
    for(k=0;k<kmax;k++){
        if (X[i][k]==1){
            IloRangeMatrix3x3 WAIT1_Bjmn(env,0);
            for(j=0;j<jmax;j++){
                if((X[k][j]==1)&&(X[i][j]==0)&&(L[i][j]==0)&&(i!=j)){
                    IloRangeMatrix2x2 WAIT1_Bmn(env,0);
                    for (m=0;m<Route[i][k];m++){
                        IloRangeArray WAIT1_Bn(env,0);
                        for(n=1;n<Route[k][j];n++){
                            IloExpr expr(env,0);

                            expr += LTijr[k][j][n]-
LTijr[i][k][m]-K[i][k][m] - T2K[k] - WTikjmn[i][k][j][m][n] -
BigM*Yikjmn[i][k][j][m][n-1];

```

```

//"- BigM*(2 - X[i][k] - X[k][j] + X[i][j])"
exasfalizetai apo if conditions metaksy twv for //

char Waiting_Time1_B[60];

sprintf(Waiting_Time1_B, "WAIT1_Bikjmn(i%d,k%d,j%d,m%d,n%d)", i,k,j,m,n);
float LB=-IloInfinity,UB=0;
IloRange

WAIT1_B(env, LB, expr, UB, Waiting_Time1_B);

expr.end();
model.add(WAIT1_B);
WAIT1_Bn.add(WAIT1_B);
}
WAIT1_Bmn.add(WAIT1_Bn);

}
WAIT1_Bjmn.add(WAIT1_Bmn);

}

}
WAIT1_Bkjm.add(WAIT1_Bjmn);
}
}
WAIT1_Bikjmn.add(WAIT1_Bkjm);
}

cout<<"2st constraint stated";
system ("pause");

//-----
//----- Binary Y (3) -----
//----- Part A -----

IloRangeMatrix5x5 BIN_Aikjmn(env,0);
for(i=0;i<imax;i++){
IloRangeMatrix4x4 BIN_Akjmn(env,0);
for(k=0;k<kmax;k++){
if (X[i][k]==1){
IloRangeMatrix3x3 BIN_Ajmn(env,0);
for(j=0;j<jmax;j++){
if((X[k][j]==1)&&(X[i][j]==0)&&(L[i][j]==0)&&(i!=j)){
IloRangeMatrix2x2 BIN_Amn(env,0);
for (m=0;m<Route[i][k];m++){
IloRangeArray BIN_An(env,0);
for(n=0;n<Route[k][j];n++){
IloExpr expr(env,0);

expr += SmallM*(LTijr[k][j][n] - LTijr[i][k][m]-
K[i][k][m] -T2K[k]) - Yikjmn[i][k][j][m][n];

// - BigM*(2 - X[i][k] - X[k][j] + X[i][j])
omoiws me parapanw, exasfalizetai me if condition

char Binary_Y_A[60];

sprintf(Binary_Y_A, "BIN_Aikjmn(i%d,k%d,j%d,m%d,n%d)", i,k,j,m,n);

```

```

float LB=-IloInfinity,UB=0;
IloRange BIN_A(env, LB, expr, UB, Binary_Y_A);
expr.end();
model.add(BIN_A);

BIN_An.add(BIN_A);

    }
    BIN_Amn.add(BIN_An);
    }
    BIN_Ajmn.add(BIN_Amn);
    }

    }
    BIN_Akjm.add(BIN_Ajmn);
    }
    }
    BIN_Aikjmn.add(BIN_Akjm);
}
cout<<"3rd constraint Y part A stated";
system ("pause");

//-----
//----- Binary Y (3) -----
//----- Part B -----

IloRangeMatrix5x5 BIN_Bikjmn(env,0);
for(i=0;i<imax;i++){
    IloRangeMatrix4x4 BIN_Bkjmn(env,0);
    for(k=0;k<kmax;k++){
        if (X[i][k]==1){
            IloRangeMatrix3x3 BIN_Bjmn(env,0);
            for(j=0;j<jmax;j++){
                if((X[k][j]==1)&&(X[i][j]==0)&&(L[i][j]==0)&&(i!=j)){
                    IloRangeMatrix2x2 BIN_Bmn(env,0);
                    for (m=0;m<Route[i][k];m++){
                        IloRangeArray BIN_Bn(env,0);
                        for(n=0;n<Route[k][j];n++){

                            IloExpr expr(env,0);

                            expr += 1 + SmallM*(LTijr[k][j][n] -
LTijr[i][k][m]-K[i][k][m] - T2K[k]) -Yikjmn[i][k][j][m][n];

                                // + BigM*(2 - X[i][k] - X[k][j] +
X[i][j]) exasfalizetai apo if conditions

                                char Binary_Y_B[60];

                                sprintf(Binary_Y_B, "BIN_Bikjmn(i%d,k%d,j%d,m%d,n%d)",i,k,j,m,n);
                                float LB=0,UB=IloInfinity;
                                IloRange

BIN_B(env, LB, expr, UB, Binary_Y_B);

                                expr.end();
                                model.add(BIN_B);
                                BIN_Bn.add(BIN_B);

                                }
                                BIN_Bmn.add(BIN_Bn);
                                }
                                BIN_Bjmn.add(BIN_Bmn);

```


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```

        TCON_Aikjm.add(TCON_Akjm);
    }

    cout<<" 5th constraint TRAIN CONTINUITY stated ";
    system ("pause");

    ////-----
    ////----- train route gap -----
    -
    ////-----

    IloRangeMatrix3x3 GAP_Bijr(env,0);
    for(i=0;i<kmax;i++){
        IloRangeMatrix2x2 GAP_Bjr(env,0);
        for(j=0;j<kmax;j++){
            if (G[i][j]==1){
                IloRangeArray GAP_Br(env,0);
                for (r=1;r<Route[i][j];r++){

                    IloExpr expr(env,0);

                    expr += (LTijr[i][j][r] - LTijr[i][j][r-1]);

                    char TGAP_B[60];
                    sprintf(TGAP_B,"GAP_Bijr(i%d,j%d,r%d)",i,j,r);
                    float LB=1,UB=IloInfinity;
                    IloRange GAP_B(env,LB,expr,UB,TGAP_B);
                    expr.end();
                    model.add(GAP_B);
                    GAP_Br.add(GAP_B);

                }
                GAP_Bjr.add(GAP_Br);
            }
        }
        GAP_Bijr.add(GAP_Bjr);
    }

    cout<<" 6th constraint TRAIN GAP stated ";
    system ("pause");

    //-----
    //-----Objective Function-----
    //-----

    IloExpr expr1(env);

    for(i=0;i<imax;i++){

        for(k=0;k<kmax;k++){

            if (X[i][k]==1){

```

```

        for(j=0;j<jmax;j++){
            if((X[k][j]==1)&&(X[i][j]==0)&&(L[i][j]==0)&&(i!=j)){
                for(m=0;m<Route[i][k];m++){
                    for(n=0;n<Route[k][j];n++){
                        if((ET[k][j][n] -
ST[i][k][m])<2880){

                            expr1+=WTikjmn[i][k][j][m][n];

                                }
                            }
                        }
                    }
                }
            }
        }

model.add(IloMinimize(env, expr1));
expr1.end();
cplex.extract(model);
cplex.exportModel("otinanai.lp");

//cplex.setParam(IloCplex::EpGap, 0.455);
//cplex.setParam(IloCplex::TiLim, 86400.00);
cplex.solve();

if (!cplex.solve ()) {
    env.error()<<"Failed to optimize LP."<<endl;
    throw(-1);
}

env.out()<<"Solution status = " <<cplex.getStatus()<<endl;
env.out()<<"Solution value = " <<cplex.getObjValue()<<endl;

cout<< "objective function stated";
system("pause");

float first_Route_Transition;
int metritis;
int athroismaWT;
int nonzeroWT;
float average;

```



```

for(i=0;i<imax;i++){
    for(k=0;k<kmax;k++){
        if(X[i][k]==1){
            for(j=0;j<jmax;j++){
                if((X[k][j]==1)&&(X[i][j]==0)&&(L[i][j]==0)&&(i!=j)){
                    for(m=0;m<Route[i][k];m++){
                        for(n=0;n<Route[k][j];n++){
                            if((ET[k][j][n] - ST[i][k][m])<2880){
                                float h =
cplex.getValue(WTikjmn[i][k][j][m][n]);

                                if (h>maxwt){
                                    maxwt=h;
                                }
                                if (h<minwt){
                                    minwt=h;
                                }
                            }
                        }
                    }
                }
            }
        }
    }
}

cout<<" max WT : "<<maxwt<<"\n";
cout<<" min WT : "<<minwt<<"\n";

system("pause");

//===== File Outputs =====

ofstream outfile_1;
outfile_1.open("DV Yikjmn kai WTikjmn.txt");
for (int i=0;i<imax;i++) {
    for(int k=0;k<kmax;k++){
        if (X[i][k]==1){
            for(int j=0;j<jmax;j++){
                if((X[k][j]==1)&&(X[i][j]==0)&&(L[i][j]==0)&&(i!=j)){
                    for(int m=0;m<Route[i][k];m++){
                        for(int n=0;n<Route[k][j];n++){
                            if((ET[k][j][n] - ST[i][k][m])<2880){
                                int d =
cplex.getValue(Yikjmn[i][k][j][m][n]);

                                int z =
cplex.getValue(WTikjmn[i][k][j][m][n]);

```

```

        outfile_1<<"Y = "<<d<<"
"<<"WT  "<<i<< , "<<k<< , "<<j<< , "<<m<< , "<<n<< = "<<z<<"\n"<<endl;

        }
        }
    }
}

outfile_1.close();

ofstream outfile_90;
outfile_90.open("DV PRWTO Yikjmn.txt");
for (int i=0;i<imax;i++) {
    for(int k=0;k<kmax;k++){
        if (X[i][k]==1){
            for(int j=0;j<jmax;j++){
                if((X[k][j]==1)&&(X[i][j]==0)&&(L[i][j]==0)&&(i!=j)){
                    for(int m=0;m<Route[i][k];m++){
                        for(int n=1;n<Route[k][j];n++){
                            if((ET[k][j][n] - ST[i][k][m])<2880){

                                int d =
cplex.getValue(Yikjmn[i][k][j][m][n-1]);
                                int p =
cplex.getValue(Yikjmn[i][k][j][m][n]);
                                if (d<p){

                                    outfile_90<<"Y  "<< , "<<i<< ,
"<<k<< , "<<j<< , "<<m<< , "<<n<< = "<<p<<"\n"<<endl;

                                    }
                                }

                            }
                        }
                    }
                }
            }
        }
    }
}

outfile_90.close();

ofstream outfile_10;
outfile_10.open("WTikjmn Values.txt");
for (int i=0;i<imax;i++) {
    for(int k=0;k<kmax;k++){
        if (X[i][k]==1){
            for(int j=0;j<jmax;j++){
                if((X[k][j]==1)&&(X[i][j]==0)&&(L[i][j]==0)&&(i!=j)){
                    for(int m=0;m<Route[i][k];m++){

```

```

        for(int n=0;n<Route[k][j];n++){
            if((ET[k][j][n] - ST[i][k][m])<2880){
                // int d =
cplex.getValue(Yikjmn[i][k][j][m][n]);

                int z =
cplex.getValue(WTikjmn[i][k][j][m][n]);

                outfile_10<<"= "<<z<<"\n"<<endl;

            }
        }
    }
}

outfile_10.close();

ofstream outfile_3;
outfile_3.open("DV LTijr.txt");
for (int i=0;i<imax;i++) {
    for(int j=0;j<jmax;j++){
        if(X[i][j]==1){
            for(int m=0;m<Route[i][j];m++){

                int w = cplex.getValue(LTijr[i][j][m]);
                outfile_3<<"LTijr "<<i<<" , "<<j<<" ,
"<<m<<" = "<<w<<"\n"<<endl;

            }
        }
    }

    outfile_3.close();

    ofstream outfile_4;
    outfile_4.open("DV LTijr_trainwn.txt");
    for (int i=0;i<3;i++) {
        for(int j=0;j<3;j++){
            if(X[i][j]==1){
                for(int m=0;m<Route[i][j];m++){

                    int w = cplex.getValue(LTijr[i][j][m]);
                    outfile_4<<"LTijr "<<i<<" , "<<j<<" ,
"<<m<<" = "<<w<<"\n"<<endl;

                }
            }
        }
    }
}

```



```
    }

    outfile_4.close();

//=====

    }
    catch ( IIOException& e){
        cerr << "concert exception caught:"<<e<<endl;
    }
    catch (...){
        cerr<<"Unknown exception caught" <<endl;
    }
    env.end();

    cout <<"ola kala"<< endl;
    system ("pause");

    return 0;
} //End main
```

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