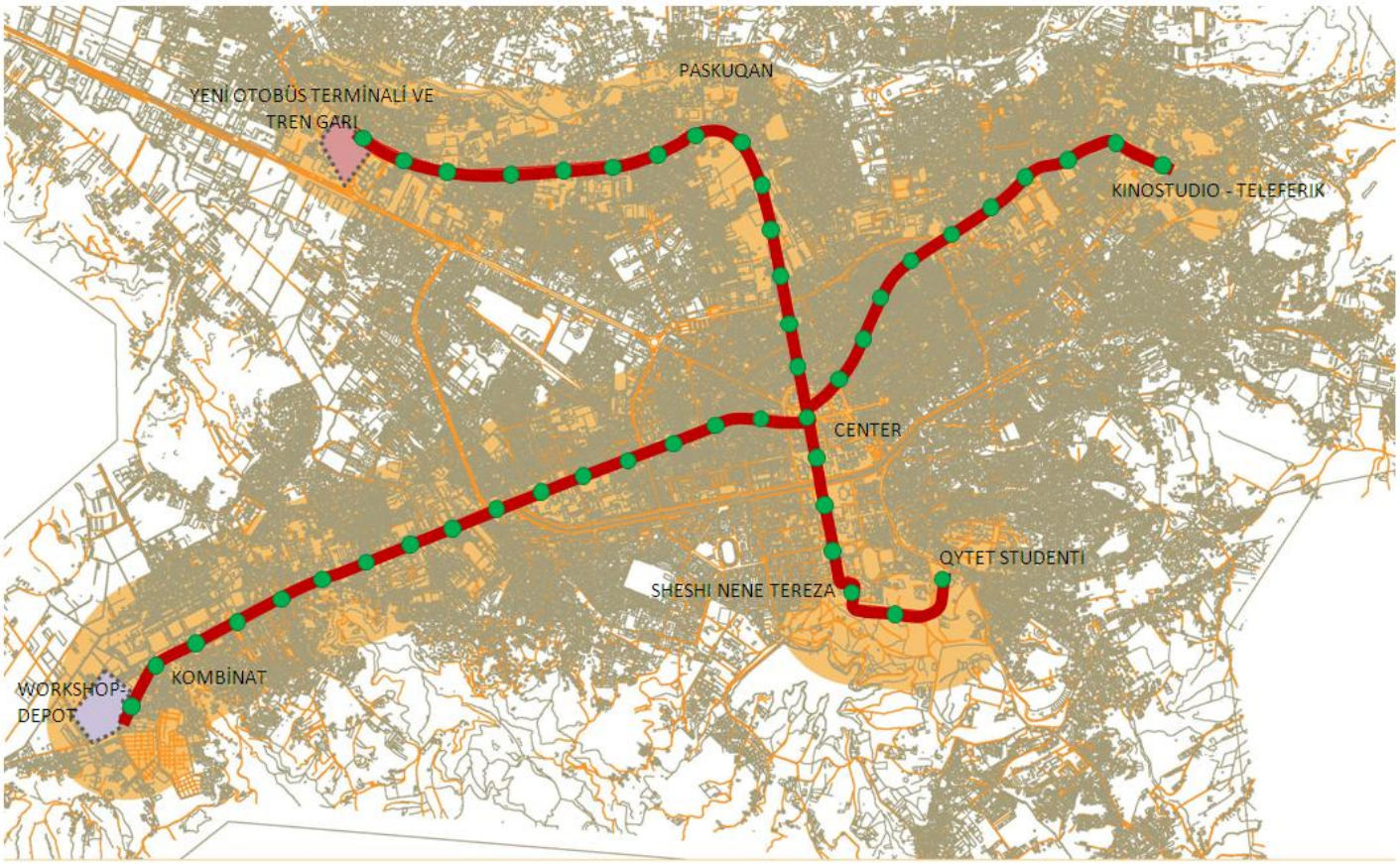
Tirana Municipality

TIRANA TRAMWAY PROJECT



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1. LOCATION OF ALBANIA

Albania, officially known as Republic of Albania is a country in Balkan Peninsula. It is bordered by Montenegro to the northwest, Kosova to the northeast, the Republic of Macedonia to the east and Greece to the south. It has a coast on the Adriatic Sea to the west, and on the Ionian Sea to the southwest. It is less than 72 km from Italy, across the Strait of Otranto which links the Adriatic Sea to the Ionian Sea.

Albania has a total area of 28,748 square kilometers and 3 million (2008) population.

Albania's coastline length is 362 km extends along the Adriatic and Ionian Seas. The 70% of the country that is mountainous is rugged and not advisable for settled land. The highest mountain is Korab reaching up to 2,753 m.

Besides the capital city of Tirana, which has 800,000 inhabitants, the principal cities are Durres, Korçe, Elbasan, Shkoder, Gjirokaster, Vlore and Kukes.

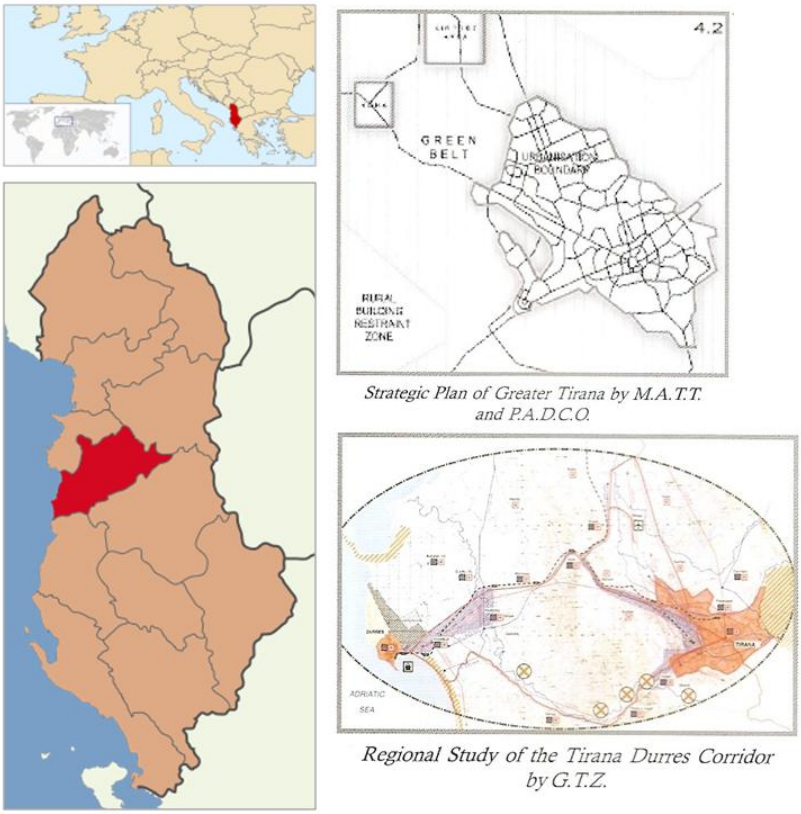


Figure 1 Location and Strategic Plan of Albania

2. THE DEVELOPMENT OF THE CITY BETWEEN 1990 – 2005

The majority of the important universities and education centres in Tirana County are located in Tirana. These include the University of Tirana, Agricultural University of Tirana, University of New York Tirana, Kristal University, Marin Barleti University, Marubi film school, Skanderbeg Military University, European University of Tirana, Luarasi University, Polytechnic University of Tirana, Academy of Physical and Sports Education Vojo Kushi and Tirana International School and many high schools. The Academy of Music and Arts of Albania and the Academy of Sciences of Albania are both located in Tirana; the Academy of Sciences of Albania has the country's largest academic library containing 8,120,000 volumes in 1986. The Political Academy of the Socialist Party of Albania have the headquarters in Golem of Kavaja part of Tirana County.

Figure 2 University of Tirana & Academy of Music and Arts of Albania

According to preliminary data from 2011 national census, the population of Tirana within city limits is 421,286. Tirana County, which can be viewed as a metropolitan area, has a population of 763,634. Many large towns and villages within the county have merged with the city, due to urban sprawl, so they can be viewed as suburbs of Tirana. Some of the large suburbs, listed as separate towns, are Kamëz (67,301), Kashar (45,742), Paskuqan (37,313) and Farkë (22,713). Thus, it is fair to say that the urban area of Tirana has a population close to 600,000.

In 1703, Tirana had about 4,000 inhabitants and by 1820 the number tripled to 12,000. The first census conducted a few years after becoming capital showed a total population of 10,845. During the 1950s, Tirana experienced rapid industrial growth and the population increased to about 137,000. After the end of communist rule in 1991, Tirana experienced its fastest population growth when people from rural areas moved to the capital for better economic opportunities. In 1990, Tirana had 250,000 inhabitants, but the large-scale influx increased the population to well over 500,000. Stemming from historical migratory waves, Tirana is known for its unsurpassed hospitality represented in many traditional songs with the warm hospitality symbols of 'bread', 'salt', and 'heart'.

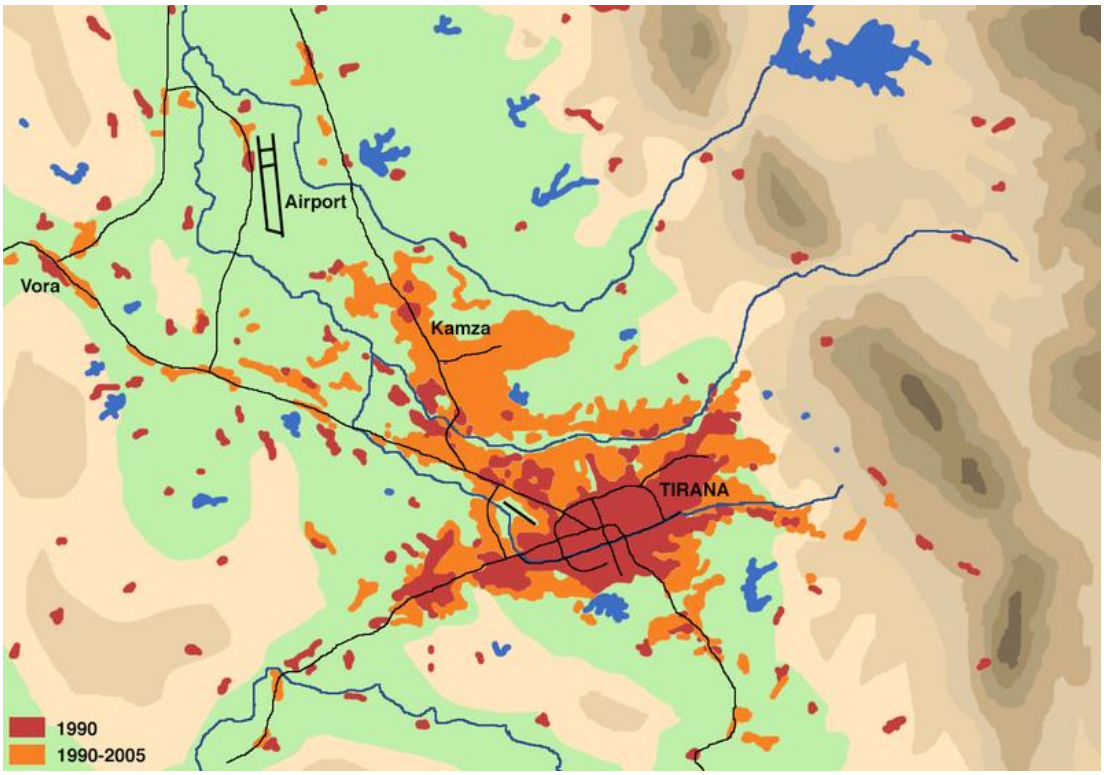


Figure 3 Schematical illustration of the population development (settlement area, commercial zones) in the region of Tirana from 1990 to 2005

Population figures are given inside city limits at that time.

Table 1 : Historical Population of Tirana.

Year	1703	1820	1923	1937	1955	1985	2001	2011
Population	4.000	12.000	10.845	35.000	108.200	200.000	597.899	763.634

3. LOCATION OF TRAMLINES ON STRATEGIC PLAN 2017 OF TIRANA

The tram lines proposed here solve the transportaion demand of the single centered city of Tirana and to create pedestrian zones in city center together with the implementation of the tramway system.

Figure 4 Traffic situation of city centre

The tram network are planned as two lines intersecting each other at İskender Bey Square.

TRACK 1- Qytet studenti – Bus Terminal 7200m

TRACK 2- Kombinat – Kinostudio 9500m

Current public transport system of the Tirana is shown in Figure 4. Existing transportation system contains 10 bus lines. About 250 to 260 buses are daily in use to operate this network. All lines are operated at least between 6h and 22h with frequencies varying from 3min (line 6) to 10 min (busses 4, 5 and 10). There are currently about 400 licensed taxis in Tirana (and about 340 taxi places laid out). There is currently no specific terminal for interurban bus services.

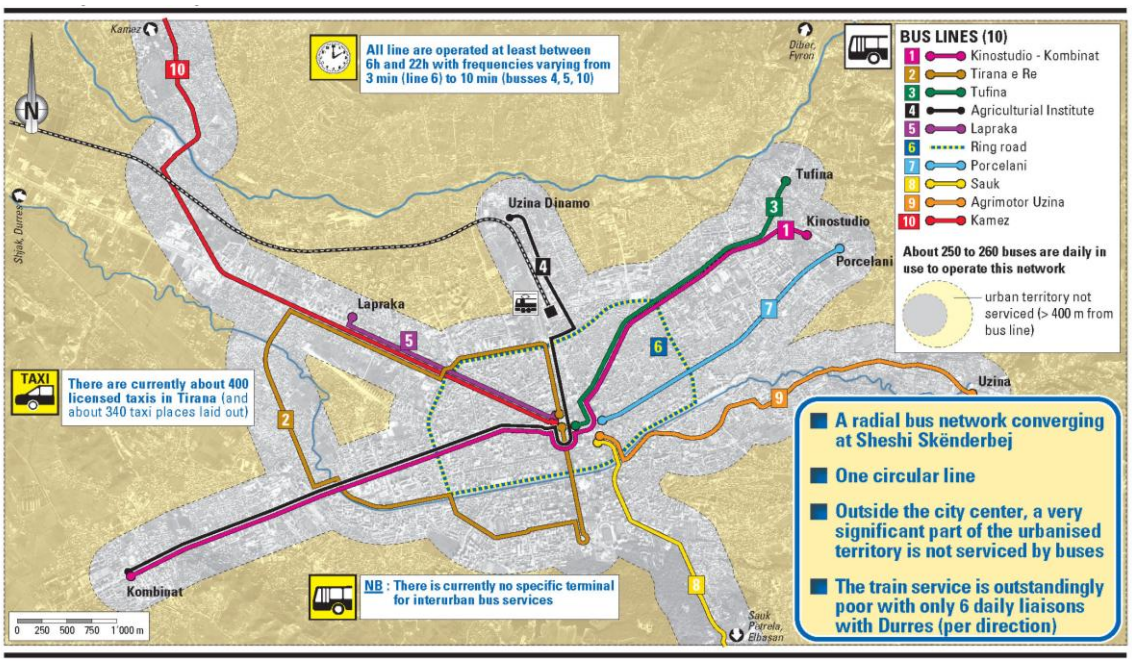


Figure 5 Current public transport network

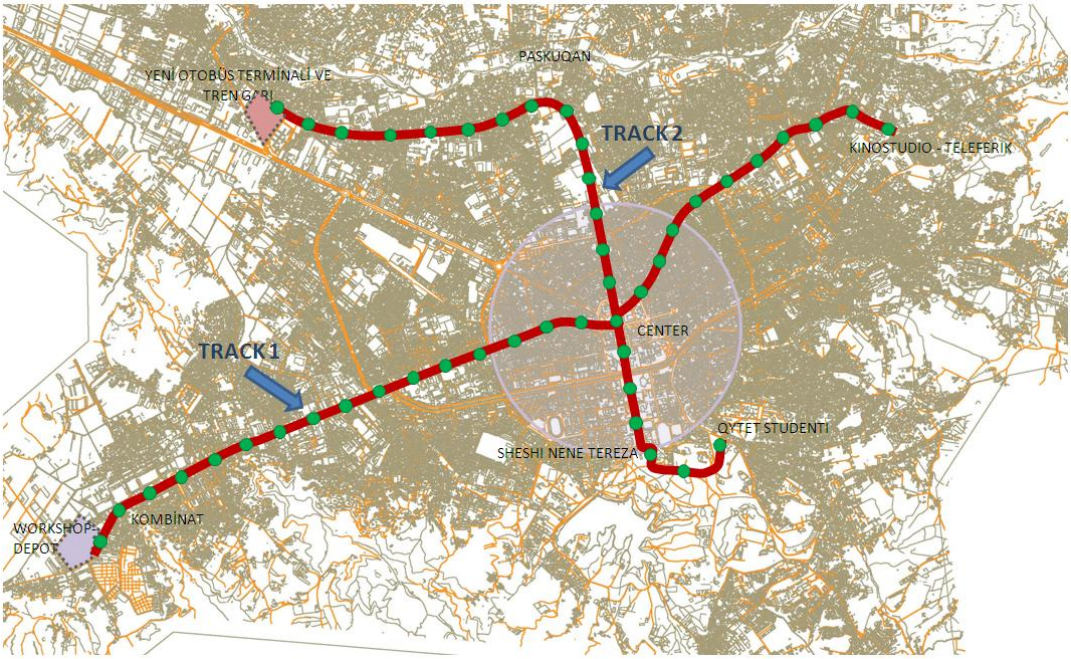


Figure 6 Proposed tram routes

With this tram network; most of the public will be able to reach to the city center, hospital, recreation spots and workplaces without any necessity for private cars.

The walking distance to reach the stops/stations for rail systems is generally presumed to be 600m. The map showing the tram lines together with the walking distances are given in Figure 7. In this figure, it can easily be observed that the tramway lines is potentially within the reach of most of the citizens.

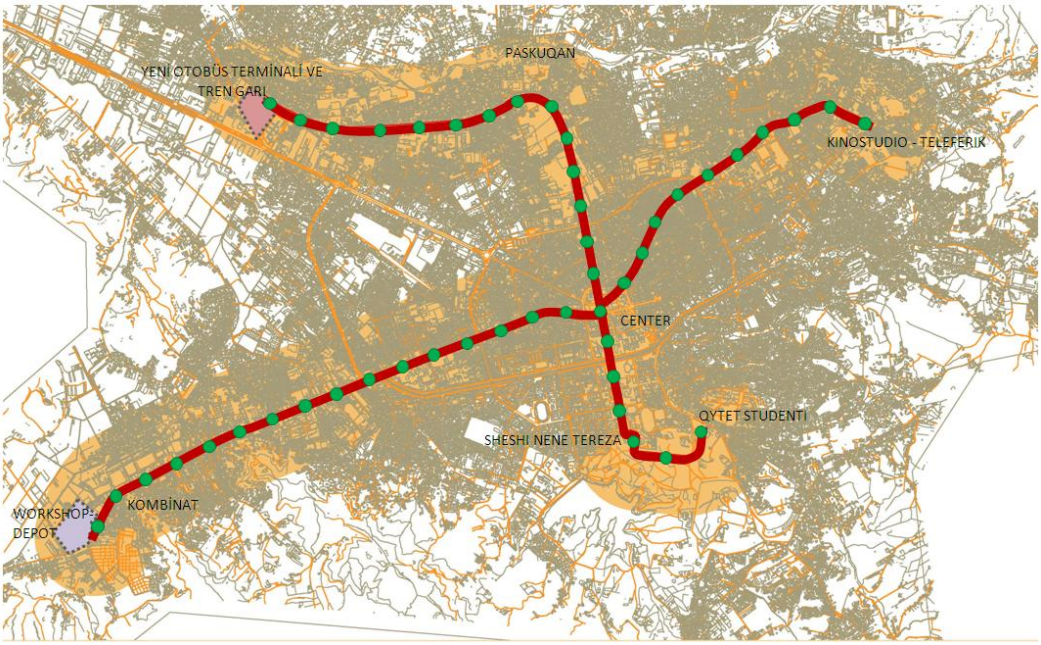
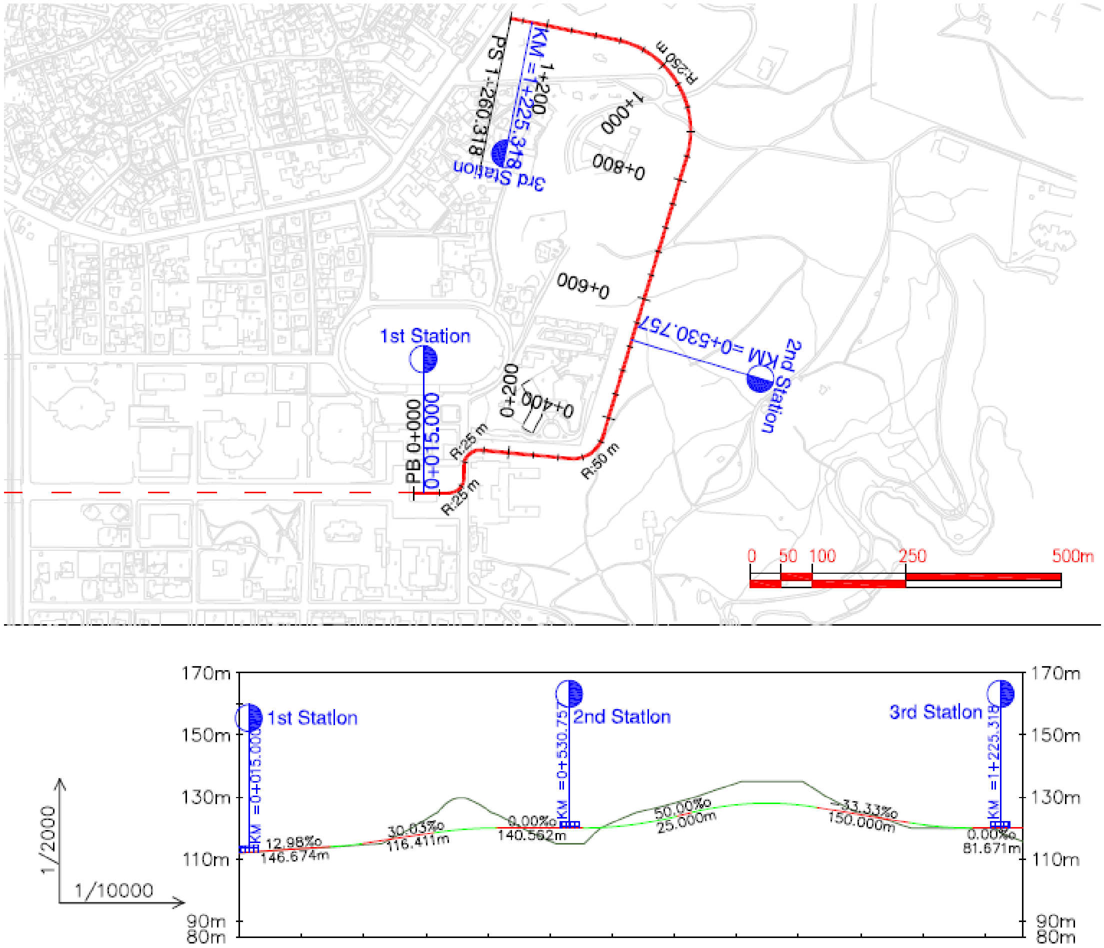


Figure 7 Minimum service area of proposed tramline (600m)

Tirana is a university city and it will be possible to reach faculties, dormitories and city's attractive social places.



RAIL LEVEL	112.023	112.673	113.322	113.973	115.103	116.604	118.106	119.403	119.974	120.000	120.000	120.000	120.358	121.547	123.570	125.973	127.507	128.000	127.451	125.955	124.288	122.622	121.031	120.137	120.000	120.000 120.000
GROUND LEVEL	112.01	112.67	113.34	113.82	114.52	117.12	122.82	129.60	125.74	120.59	115.80	115.00	121.69	125.48	128.05	131.12	134.45	135.00	135.00	129.54	125.00	122.08	120.00	120.00	120.00	116.52 115.70
CHAINAGE	0+000	0+050	0+100	0+150	0+200	0+250	0+300	0+350	0+400	0+450	0+500	0+550	0+600	0+650	0+700	0+750	0+800	0+850	0+900	0+950	1+000	1+050	1+100	1+150	1+200	1+250 1+260

Figure 8 Nene Teraza – Qytet Studenti Connection Plan & Profile

4. FINANCIAL FEASIBILITY

Apart from the social benefits of the tramway systems which is quite obvious in terms of sustainability of the green transportation of the cities, the financial studies should also be made to evaluate the profiatability of the investment.

In this perspective, the railway project should be determined as an investment where as the investor, at the end of a predefined period which is generally 25 years, should have positive yield after deducting all costs and inflation effects.

The financial feasibility of the investment will be evaluted with the IRR (Internal rate of return) and NPV (Net present value) ratios. The IRR ratio shows the rate of return of investment taking into account the negative and positive cash flow of the investment during the study period.

The net present value shows the total profit/loss at current time by discounting the cash flows during the study period. The discount ratio is determined with the opportunity cost which is usually deemed with the yield of a risk free investment such as 30 year treasury bond.

The basic operation parameters for the proposed tramway system is shown at Table 2. The proposed system comprises of 2 lines with a total length of 16700 m.

The headway that is the time between 2 consecutive trains is presumed to be 6 minutes with which the quantity of the tram car comes up to 20 pieces including the spare set for the maintenance periods.

The energy consumption is presumed to be 0.20 €/km and the maintanance cost of the tramcars is calculated as 0.4 €/km.

Taking into account the current financial crisis and hardnesses of finding required amount of credits, 2 different options/scenarios are foreseen for the implementation of the tramline project.

- All Civil and Electromechanicak works together with new tram cars (Scenario 1)
- All Civil and Electromechanicak works together with pre-owned tram cars (Scenario 2)

Table 2 : Basic operation parameters

	TIRANA TRAMWAY SYSTEM	
Operation Line	**Line 1**	**Line 2**
Double Track Length (m)	7200	9500
Commercial Speed (Km/Hr)	20	
Headway (min)	6	6
Ring Duration (min)	44	58
Dwelling time (min)	2,5	
Total Ring Duration (min)	49	63
Required Train Quantity	8	11
Railway Car in Train	1	1
Railway Car Requirement	8	11
Total Railway Car Requirement (with %5 spare)	20	
Passenger Capacity (PPDPH)	2500	2500
Occupation per hour (min/hour)	53,88	55,24
Car-Km/Hour (Peak hours)	17,96	18,41
Car-Km/Hour (Non-peak hours)	8,98	9,21
Car-Km/Day (8 hours peak - 11 hours non-peak)	242	248
Car-Km/Year	88.330	90.520
Total Car-Km/Year	1.702.360	
Car-Km Maintenance Cost	0,40 €	
Annual Car Maintenance Cost	**680.944 €**	
Car-Km Energy Cost	0,20 €	
Annual Energy Cost	**340.472 €**	

In Scenario 1, the total cost for the realization of the tramway system together with all civil works, electromechanical works and tramcars comes up to roughly 130 million €. The breakdown of the main items can be seen in Table 3.

It should be noted that nearly 35 % of the total investment is predicted to be expensed to tramcars. The rest of the budget is diversifed among civil works (32 %), depot and workshop facilities (15 %), power supply and catenary (12 %) and signalization-telecom (6 %).

Table 3 : Investment Breakdown for 1st Alternative (with new trains)

Total Investment (with new trains)

Item	Unit	Quantity	Unit Price	Cost
Construction				
Tracks and platforms	m	16.700	2.500	41.750.000 €
			Total	41.750.000 €
Depot Area and Workshop				
Depot area arrangements+tracks+turnouts+catenary+workshop facilities				20.000.000 €
			Total	20.000.000 €
Electromechanical Works				
Substation	piece	7	1.000.000 €	7.000.000 €
Catenary	km	17	500.000 €	8.500.000 €
Signal+telecom	lumpsum		8.000.000 €	8.000.000 €
Vehicle	piece	20	2.250.000 €	45.000.000 €
			Total	68.500.000 €
			Grand Total	**130.250.000 €**

In Scenario 2, the total investment decreases to nearly 99 million € with the use of the pre-owned tramcars in the system. In fact, this solution is widely exercised among cities where the authorities are eager to implement the tram system with a minimum investment.

A good example for this approach is tha tram system in Konya-Turkey where they have establish a 18 km long tram network with the pre-owned rolling stock bought from Cologne municipality in 1992. After 20 years, they still operate with the same tramcars.

It should also be noted that due to the low passenger capacity of the old second hand tramcars, the quantities have been doubled comparing to new tramcars.

The presumed credit sources and amounts are shown in table 6. The credit amounts are increased up to some extends covering the insurances of the credit that is payable with the signing of the credit agreement.

It should also be noted that the credit costs and interest rates reflects the country risks of Turkey whereas it may change slightly when applied to Albania.

Table 4 : Investment Breakdown for 2nd Alternative (with second hand trains)

Total Investment (with second hand trains)

Item	Unit	Quantity	Unit Price	Cost
Construction				
Tracks and platforms	m	16.700	2.500	41.750.000 €
			Total	41.750.000 €
Depot Area and Workshop				
Depot area arrangements+tracks+turnouts+catenary+workshop facilities				20.000.000 €
			Total	20.000.000 €
Electromechanical Works				
Substation	piece	7	1.000.000 €	7.000.000 €
Catenary	km	17	500.000 €	8.500.000 €
Signal+telecom	lumpsum		8.000.000 €	8.000.000 €
Vehicle	piece	40	350.000 €	14.000.000 €
			Total	37.500.000 €
			Grand Total	**99.250.000 €**

Table 5 : Credit Summary

Credit Summary (with new trains)

Credit Type	Ratio %	Duration (Year)	İnterest %	No payment Period (years)	Credit Amount (€)	Insurance + Management fees %	Insurance + Management fees €
ECA	75,00	13	4,5	3	110.694.051 €	11,75%	13.006.551 €
Commercial	25,00	13	5	3	37.819.396 €	13,90%	5.256.896 €

Credit Summary (with second hand trains)

Credit Type	Ratio %	Duration (Year)	İnterest %	No payment Period (years)	Credit Amount (€)	Insurance + Management fees %	Insurance + Management fees €
ECA	75,00	13	2,75	3	84.348.442 €	11,75%	9.910.942 €
Commercial	25,00	13	3,5	3	28.818.235 €	13,90%	4.005.735 €

The total amount of credit is assumed to be collected from ECA and commercial banks in 75% and 25% ratio respectively.

In the credit terms, both ECA and commercial credit periods are foreseen to be 13 years with 3 years of non-payment period excluding the insurance and management fees.

The total credit payments to be made in 13 years period with the seperation of credit sources and fees are shown at Table 6 and 7.

On the revenue side, In order to derive the incomes of the investment more precisely, a detailed transportation demand analysis is required with origin-destination matrixes to determine the possible passenger quantities.

However, according to the information gained from the authorities combined with the observations made at the site visits, we presume to have about 60,000 passengers/day in the first year of operation and projected to increase to 100,000 pass/day with a %5 increase annually.

The ticket price currently is about 0.3 € which can be considered as quite low and in this study, it is presumed to be 0.5 €.

The total number of staff including drivers, cleaning, security and maintenance facilities is presumed to be around 433 with an average salary of 400 €.

The maintenance budget for fixed facilities (excluding vehicles) is presumed to be annually %1 of the initial investment.

5. SENSIBILITY ANALYSIS

In the financial analysis with the current operation configuration, the IRR value of 4.72% for new tramcars seem to be a bit lower than expected. This may be the result of several parameters such as tramcar quantity,passenger demand,ticket price and financial costs.

Table 6 : Sensibility analysis results

	New Car	Second Hand Car
Initial Investment Value	175 m €	113 m €
Headway	3 dak.	3 dak.
Ticket Price	0,50 €	0,50 €
IRR	6.48 %	17,98%
Initial Investment Value	175 m €	113 m €
Headway (min)	3 dak.	3 dak.
Ticket Price	0,60 €	0,60 €
IRR	10,39%	27,03%
Initial Investment Value	130 m €	100 m €
Headway	6 dakika	6 dakika
Ticket Price	0,50 €	0,50 €
IRR	4,72%	10.59%
Initial Investment Value	130 m €	100 m €
Headway	6 dakika	6 dakika
Ticket Price	0,60 €	0,60 €
IRR	8.02%	16,00%

Among these parameters, there are some items such as financial costs which cannot be altered for seeking the optimum solutions. But, for the other parameters, the sensibility analysis can be made to see how one parameter changes the overall profitability. The results of this analysis made through ticket price and tramcar quantities (with the increased headway) are as follows.

According to the results above, it can be observed that the increase in the tramcar quantities with operation made in 3 minute headway can push the IRR values from 10.59 % to 17.98 % on the second hand tramcar alternative. It should also be noted here is that this is only valid if the passenger demand is high enough to respond to the capacity increase where 150,000 passenger are foreseen to be carried daily several years after the inaugaration of the line. According to our experience, this can be achieved when comparing to similar cities in Turkey.

The other outcome of this analysis is that the increase of the ticket price from 0.5€ to 0.6€ can also causes the IRR values to have certain amount of gain from 4.72% to 8.02 % for the new tramcars.

Although this analysis shows how the parameter altering changes the overall profitability, the desicionmakers should of course consider the credit sources taking into account the amount they can allocate for this project.

6. CONCLUSION

We should admit that most of the transportation projects are generally produced earnings lower than the financial institutes expect. This is due to the fact that the ticket prices are the only source of revenue which is governed by the local authorities. With this in mind, they are generally subsidized by the goverments with a consideration that they are public investment. With this perspective, the evaluation should also be made taking into account the secondary benefits such as less carbon emmision, less traffic accidents, less time waste, less bus

investment and road repairs which encourages the tram system investments which is the scope of economical feasibility studies. If those benefits are quantified, it will ensure the desicion makers that the tramway systems are quite feasible with the IRR and NPV values lurking high above the expected amounts.

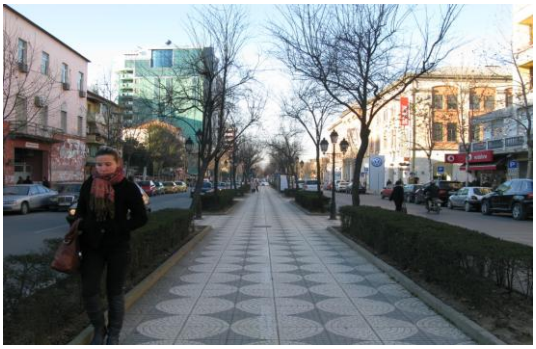






Figure 9 Proposed tram route photos

Figure 10 Sample perspective for a tram stop

Figure 11 Sample perspective for a tram

Credit Payment (with new trains)

Year	ECA						Commercial Credit						Grand Total
	Credit Amount	Interest	Insurance + Commitment Fee	Agency + coord + mngmt Fee	Principal	Total Payment	Credit Amount	Interest	Insurance + Commitment Fee	Agency + coord + mngmt Fee	Principal	Total Payment	
2012	110.694.051 €		13.006.551 €	1.005.205 €		14.011.756 €	37.819.396 €		5.256.896 €	408.645 €		5.665.542 €	19.677.298 €
2013	115.675.283 €			25.000 €		25.000 €	39.710.366 €			25.000 €		25.000 €	50.000 €
2014	120.880.671 €			25.000 €		25.000 €	41.695.884 €			25.000 €		25.000 €	50.000 €
2015	126.320.301 €	5.684.414 €		25.000 €	12.632.030 €	18.341.444 €	43.780.678 €	2.189.034 €		25.000 €	4.378.068 €	6.592.102 €	24.933.545 €
2016	113.688.271 €	5.115.972 €		25.000 €	12.632.030 €	17.773.002 €	39.402.611 €	1.970.131 €		25.000 €	4.378.068 €	6.373.198 €	24.146.201 €
2017	101.056.241 €	4.547.531 €		25.000 €	12.632.030 €	17.204.561 €	35.024.543 €	1.751.227 €		25.000 €	4.378.068 €	6.154.295 €	23.358.856 €
2018	88.424.211 €	3.979.089 €		25.000 €	12.632.030 €	16.636.120 €	30.646.475 €	1.532.324 €		25.000 €	4.378.068 €	5.935.392 €	22.571.511 €
2019	75.792.181 €	3.410.648 €		25.000 €	12.632.030 €	16.067.678 €	26.268.407 €	1.313.420 €		25.000 €	4.378.068 €	5.716.488 €	21.784.166 €
2020	63.160.151 €	2.842.207 €		25.000 €	12.632.030 €	15.499.237 €	21.890.339 €	1.094.517 €		25.000 €	4.378.068 €	5.497.585 €	20.996.822 €
2021	50.528.120 €	2.273.765 €		25.000 €	12.632.030 €	14.930.796 €	17.512.271 €	875.614 €		25.000 €	4.378.068 €	5.278.681 €	20.209.477 €
2022	37.896.090 €	1.705.324 €		25.000 €	12.632.030 €	14.362.354 €	13.134.204 €	656.710 €		25.000 €	4.378.068 €	5.059.778 €	19.422.132 €
2023	25.264.060 €	1.136.883 €		25.000 €	12.632.030 €	13.793.913 €	8.756.136 €	437.807 €		25.000 €	4.378.068 €	4.840.875 €	18.634.787 €
2025	12.632.030 €	568.441 €		25.000 €	12.632.030 €	13.225.471 €	4.378.068 €	218.903 €		25.000 €	4.378.068 €	4.621.971 €	17.847.443 €
Total		**31.264.275 €**	**13.006.551 €**	**1.305.205 €**	**126.320.301 €**	**171.896.332 €**		**12.039.687 €**	**5.256.896 €**	**708.645 €**	**43.780.678 €**	**61.785.906 €**	**233.682.239 €**

Credit Payment (with second hand trains)

Year	ECA						Commercial Credit						Grand Total
	Credit Amount	Interest	Insurance + Commitment Fee	Agency + coord + mngmt Fee	Principal	Total Payment	Credit Amount	Interest	Insurance + Commitment Fee	Agency + coord + mngmt Fee	Principal	Total Payment	
2012	84.348.442 €		9.910.942 €	807.613 €		10.718.555 €	28.818.235 €		4.005.735 €	341.137 €		4.346.871 €	15.065.427 €
2013	86.668.024 €			25.000 €		25.000 €	29.826.873 €			25.000 €		25.000 €	50.000 €
2014	89.051.395 €			25.000 €		25.000 €	30.870.813 €			25.000 €		25.000 €	50.000 €
2015	91.500.308 €	2.516.258 €		25.000 €	9.150.031 €	11.691.289 €	31.951.292 €	1.118.295 €		25.000 €	3.195.129 €	4.338.424 €	16.029.714 €
2016	82.350.277 €	2.264.633 €		25.000 €	9.150.031 €	11.439.663 €	28.756.163 €	1.006.466 €		25.000 €	3.195.129 €	4.226.595 €	15.666.258 €
2017	73.200.246 €	2.013.007 €		25.000 €	9.150.031 €	11.188.038 €	25.561.033 €	894.636 €		25.000 €	3.195.129 €	4.114.765 €	15.302.803 €
2018	64.050.216 €	1.761.381 €		25.000 €	9.150.031 €	10.936.412 €	22.365.904 €	782.807 €		25.000 €	3.195.129 €	4.002.936 €	14.939.348 €
2019	54.900.185 €	1.509.755 €		25.000 €	9.150.031 €	10.684.786 €	19.170.775 €	670.977 €		25.000 €	3.195.129 €	3.891.106 €	14.575.892 €
2020	45.750.154 €	1.258.129 €		25.000 €	9.150.031 €	10.433.160 €	15.975.646 €	559.148 €		25.000 €	3.195.129 €	3.779.277 €	14.212.437 €
2021	36.600.123 €	1.006.503 €		25.000 €	9.150.031 €	10.181.534 €	12.780.517 €	447.318 €		25.000 €	3.195.129 €	3.667.447 €	13.848.981 €
2022	27.450.092 €	754.878 €		25.000 €	9.150.031 €	9.929.908 €	9.585.388 €	335.489 €		25.000 €	3.195.129 €	3.555.618 €	13.485.526 €
2023	18.300.062 €	503.252 €		25.000 €	9.150.031 €	9.678.283 €	6.390.258 €	223.659 €		25.000 €	3.195.129 €	3.443.788 €	13.122.071 €
2025	9.150.031 €	251.626 €		25.000 €	9.150.031 €	9.426.657 €	3.195.129 €	111.830 €		25.000 €	3.195.129 €	3.331.959 €	12.758.615 €
Total		**13.839.422 €**	**9.910.942 €**	**1.107.613 €**	**91.500.308 €**	**116.358.285 €**		**6.150.624 €**	**4.005.735 €**	**641.137 €**	**31.951.292 €**	**42.748.787 €**	**159.107.072 €**

Internal Rate of Return Analysis (with new trains)

Year	Track and Facility İnvestment	Vehicle Investment	Operation Expenses	Credit Payment	Total Expenses	Operation Income	Net Cash Flow
2012	42.625.000 €	22.500.000 €		19.677.298 €	19.677.298 €		-19.677.298 €
2013	42.625.000 €	22.500.000 €		50.000 €	50.000 €		-50.000 €
2014			3.952.316 €	50.000 €	4.002.316 €	10.950.000 €	6.947.684 €
2015			3.967.650 €	24.933.545 €	28.901.196 €	11.497.500 €	-17.403.696 €
2016			3.983.138 €	24.146.201 €	28.129.339 €	12.072.375 €	-16.056.964 €
2017			3.998.781 €	23.358.856 €	27.357.637 €	12.675.994 €	-14.681.643 €
2018			4.014.580 €	22.571.511 €	26.586.091 €	13.309.793 €	-13.276.298 €
2019			4.030.537 €	21.784.166 €	25.814.703 €	13.975.283 €	-11.839.420 €
2020			4.046.654 €	20.996.822 €	25.043.475 €	14.674.047 €	-10.369.428 €
2021			4.062.932 €	20.209.477 €	24.272.408 €	15.407.750 €	-8.864.659 €
2022			4.079.372 €	19.422.132 €	23.501.504 €	16.178.137 €	-7.323.367 €
2023			4.095.977 €	18.634.787 €	22.730.765 €	16.987.044 €	-5.743.721 €
2024			4.112.748 €	17.847.443 €	21.960.191 €	17.836.396 €	-4.123.795 €
2025			4.129.687 €		4.129.687 €	18.250.000 €	14.120.313 €
2026			4.146.795 €		4.146.795 €	18.250.000 €	14.103.205 €
2027			4.164.074 €		4.164.074 €	18.250.000 €	14.085.926 €
2028			4.181.526 €		4.181.526 €	18.250.000 €	14.068.474 €
2029			4.199.153 €		4.199.153 €	18.250.000 €	14.050.847 €
2030			4.216.956 €		4.216.956 €	18.250.000 €	14.033.044 €
2031			4.234.937 €		4.234.937 €	18.250.000 €	14.015.063 €
2032			4.253.097 €		4.253.097 €	18.250.000 €	13.996.903 €
2033			4.271.439 €		4.271.439 €	18.250.000 €	13.978.561 €
2034			4.289.965 €		4.289.965 €	18.250.000 €	13.960.035 €
2035			4.308.676 €		4.308.676 €	18.250.000 €	13.941.324 €
2036			4.327.574 €		4.327.574 €	18.250.000 €	13.922.426 €
2037			4.346.661 €		4.346.661 €	18.250.000 €	13.903.339 €
2038			4.365.939 €		4.365.939 €	18.250.000 €	61.779.894 €
Residual Value	-43.395.833 €	-4.500.000 €				47.895.833 €	

NPV = -27.577.513 €
IRR= 4,72%
Opp. Cost = 8,00%

Internal Rate of Return Analysis (with second hand trains)

Year	Track and Facility İnvestment	Vehicle Investment	Operation Expenses	Credit Payment	Total Expenses	Operation Income	Net Cash Flow
2012	42.625.000 €	7.000.000 €		15.065.427 €	15.065.427 €		-15.065.427 €
2013	42.625.000 €	7.000.000 €		50.000 €	50.000 €		-50.000 €
2014			3.952.316 €	50.000 €	4.002.316 €	10.950.000 €	6.947.684 €
2015			3.967.650 €	16.029.714 €	19.997.364 €	11.497.500 €	-8.499.864 €
2016			3.983.138 €	15.666.258 €	19.649.397 €	12.072.375 €	-7.577.022 €
2017			3.998.781 €	15.302.803 €	19.301.584 €	12.675.994 €	-6.625.590 €
2018			4.014.580 €	14.939.348 €	18.953.928 €	13.309.793 €	-5.644.134 €
2019			4.030.537 €	14.575.892 €	18.606.429 €	13.975.283 €	-4.631.146 €
2020			4.046.654 €	14.212.437 €	18.259.091 €	14.674.047 €	-3.585.043 €
2021			4.062.932 €	13.848.981 €	17.911.913 €	15.407.750 €	-2.504.163 €
2022			4.079.372 €	13.485.526 €	17.564.898 €	16.178.137 €	-1.386.761 €
2023			4.095.977 €	13.122.071 €	17.218.048 €	16.987.044 €	-231.004 €
2024			4.112.748 €	12.758.615 €	16.871.364 €	17.836.396 €	965.033 €
2025			4.129.687 €		4.129.687 €	18.250.000 €	14.120.313 €
2026			4.146.795 €		4.146.795 €	18.250.000 €	14.103.205 €
2027			4.164.074 €		4.164.074 €	18.250.000 €	14.085.926 €
2028			4.181.526 €		4.181.526 €	18.250.000 €	14.068.474 €
2029			4.199.153 €		4.199.153 €	18.250.000 €	14.050.847 €
2030			4.216.956 €		4.216.956 €	18.250.000 €	14.033.044 €
2031			4.234.937 €		4.234.937 €	18.250.000 €	14.015.063 €
2032			4.253.097 €		4.253.097 €	18.250.000 €	13.996.903 €
2033			4.271.439 €		4.271.439 €	18.250.000 €	13.978.561 €
2034			4.289.965 €		4.289.965 €	18.250.000 €	13.960.035 €
2035			4.308.676 €		4.308.676 €	18.250.000 €	13.941.324 €
2036			4.327.574 €		4.327.574 €	18.250.000 €	13.922.426 €
2037			4.346.661 €		4.346.661 €	18.250.000 €	13.903.339 €
2038			4.365.939 €		4.365.939 €	18.250.000 €	57.279.894 €
Residual Value	-43.395.833 €	0 €				43.395.833 €	

NPV = 14.816.123 €
IRR= 10,59%
Opp. Cost = 8,00%