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Feasibility and Transferability Analysis of energy-efficient and sustainable logistics solutions in Balchik

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in Balchik

WP3: Improving energy efficiency of urban logistics in
Small/Mid-size historic towns: piloting, assessment,
transferability and development of Sulp
20/11/2013 / v. 2.0
Municipality Balchik
Boyko Ranguelev - MGU

1. Balchik context

1.1 Mobility and traffic figures.

- Balchik and surroundings.

1.1.1. Balchik municipality – general description

Balchik municipality is located in North-East Bulgaria in the Dobrich District. It is a Black Sea municipality, a resort center and a popular tourist destination. The town of Balchik is small sized with about 23 000 inhabitants. During the summer time they can reach a number of about 25 000. There are two ports in the town - Cargo berth and Yacht marine – both located on the sea coast just down the town. The Cargo is used generally in season's regime – mainly summer and autumn due to the exported goods – mainly corn and wheat. Huge storage building about such goods is located just at the port entrance. During the summer and autumn season's huge quantities of rough grain are exported. The road entrances and exits of the town are two min and two smaller due to the specific geography position - hill area - and are dictated by the local topography. The huge landslides surrounded the town above.

ALBENA Resort

The ALBENA resort's hotels are about sixty and have more then 20 000 beds in single, double, triple rooms and apartments. During the summer time almost all facilities are in use. During the other seasons – only part of the hotels are open, especially those with SPA facilities. The ALBENA resort is a huge complex with large development of the logistics during the summer. It could be the only place, where the optimization of logistics, ENCLOSE experience and CO2 and other gas polluters can decrease due to the different measures. Unfortunately, this is a private consortium property and not under the Balchik municipality owners' jurisdiction.

Sea resort TUZLATA

This is a small recreation area (Sanatorium) with a unique former lagoon and a mud lake with healthy mud and all mud procedures included in it. It is located about 10 km north of town of Balchik and is very famous among the people needed mud procedures.

University Botanical Garden

The **Botanical Garden** is the main attraction in town of [Balchik](#). Its 10 hectares surround the small summer palace of the Romanian Queen Marie – XX century. The gardens are set on a steep hillside – deep huge landslide with Pleistocene age, and descend in 6 terraces to the sea - supposedly one for each of the Queen's children. There are over 3000 varieties of shrubs, roses and flowers, set among streams, waterfalls, and ornamental channels. This is the only almost pure “green area” in Balchik with all restrictions to cars and logistics. The Botanical garden is under the jurisdiction of the Sofia University “St.K.Ohridski”

1.1.2. Some statistics about Balchik and Balchik municipality

Area size of Balchik municipality: 523km²

Area size of Balchik town: 23 km²

Population of Balchik municipality: 23161 people (during summer time increased by 2000-3000 people)

Total Towns and Cities in Balchik municipality: 1

Total Villages in Balchik municipality: 21

Centre of Municipality Balchik: Town of Balchik

Total length of streets in Balchik: 213 km

Main industry: tourism (Albena resort), mining (Village of Obrochishte – a manganese mine), port activities (Balchik – two ports)

Cities and villages in Balchik municipality: Town of Balchik, Village of Bezvoditsa, Village of Bobovets, Village of Bryastovo, Village of Gurkovo, Village of Dropla, Village of Dabrava, Village of Zmeevo, Village of Karvuna, Village of Kranevo, Village of Kremena, Village of Lyahovo, Village of Obrochishte, Village of Prespa, Village of Rogachevo, Village of Senokos, Village of Sokolovo, Village of Strajitsa, Village of Trigortsi, Village of Hrabrovo, Village of Tsarichino, Village of Tsurkva



Balchik town, Obrochishte mining village (blue), Botanical gardens with the Queen's Mary Palace (magenta) and the main tourist areas – Balchik promenade and Albena resort (green)

1.2 Main mobility and transport systems

1.2.1 Historical development of the transport system.

Balchik is small sized town with rich history. It was established like a settlement about 3-4 000 years BC (during the Neolithic period). The town was a huge colony during the Hellenistic period famous with its Cybele temple – IV BC-VI AD. This temple was discovered

in April, 2007 during the building excavation and then excavated by archaeologists. The temple is most preserved one all over the Balkans. It was destroyed by a complex hazardous event (most probably earthquake, triggered tsunami and buried by a landslide in 454 AD). Now, the Cybele temple is considered as a main historical attraction for the tourists. There is a small local parking (about 10-15 cars) just near to the excavations.

According the local archaeological and historical investigations – Balchik is considered as a town survived 7 civilizations – since the Neolithic period up to the present days.

During the mid centuries Balchik was under Bulgarian and Venetian conquest. After 1400 it becomes a part of the Ottoman empery. During that time it was a small port for farmers' products shipment with very local influence.

During its history the town was affected by earthquakes, sometimes tsunamis and most frequently by landslides.

During the present days Balchik is a small Black Sea municipality, a resort centre and a popular tourist destination. There are two ports in the town of Balchik - Cargo berth and Yacht marine – both located on the sea coast just down the town. The Cargo is used generally in season's regime – mainly summer and autumn due to the exported goods – in general corn and wheat. Huge storage building about such goods is located just at the port entrance. During the summer and autumn season's huge quantities of rough grain are exported. This suggests the huge seasonal traffic by heavy trucks.

The main traffic streams are going trough the two main entrances/exits located at the relatively smooth plain. Going down steep slopes are developed by the very intensive local active landslides. It gives the town very specific morphology of the streets, shops and entertainment facilities. The local streets are developed in two main types:

- straight streets (localized in the new built part of the town) and
- very curvy streets (on the steep slopes) of the older part of the town.



Areas in Balchik with straight streets (red) and curvy streets (magenta)



Balchik – main road entrances/exits. The “green area” is magenta circle. The peers of the ports (Cargo berth and Yacht marine) are visible in the sea (blue area).

The air quality is not a significant issue in Balchik. This is due to the local morphology and year wind directions. The local sea breeze is blowing to and from the sea almost all year. Very few days (during the winter cold days) are with local inversion. The dominant season winds are Northward and South-westward.



Predominant wind directions (breeze – green arrows) and dominant seasonal winds - magenta arrows.

1.2.2 Access Restriction Strategy

The strategy followed during the last years was to develop integrated actions within the town central part and its surrounding areas that decrease the pressure produced by social and economic demands, with special emphasis placed on sustainable urban transport.

At the same time, pedestrian traffic was encouraged around the Promenade by providing comfortable and safe areas for walking, resting and enjoying, achieving this, the priority area for pedestrians was analyzed and will continue to be developed – shops and entertainment facilities enlarged.

To apply these measures, the Municipality Court drew up new itineraries for heavy vehicles, design traffic signs for the outer roads including different limitations:

The following actions were developed in the historical part and surrounding areas:

- Enhancement of pedestrian walkways
- Development of access to pedestrian zones for residents and tourists
- Introduction of mechanical systems to restrict access - barriers
- Implementation of access and parking measures for residents (actively involving live guards and a guard firm in drawing up procedures for stakeholders, permits, secure methods, etc)
- Design of access schedules for delivery vehicles and communication of such measures to the private delivery cars
- Promotion of restricted access for heavy vehicles in the town centre and coastal area
- Modifications to traffic directions around coastal streets to reduce congestion

The measure results regarding traffic are:

- The vehicle speed was limited through speed radars which were included next to the coastal streets where the mayor number of vehicles used this street to arrive the town. The data was an average of the data obtained during one day using the speed radars. A short reduction of the velocity was observed in the period of the project.
- Car reduction in restricted area as the number of vehicles was reduced in the internal trips inside the area. It is due to the actions of access restriction and pedestrian area which forced to reduce the impact of the particular vehicle and loading and unloading at the hotels around.

The Municipality Transport Strategy (MTS) is developed with a Vision and Objectives over a 10-15 years period for meeting the transport needs of people, businesses and tourism throughout the region. One of the RTS objectives is to improve the efficiency, reliability and integration of the movement of goods and people, as main target is the tourist traffic.

The normative regulations are related to the main access to the tourist attractions, hotels and beaches. There are traffic restrictions related to the main pedestrian area – the local promenade (totally restricted for the most morning and evening hours), where the hotels, restaurants and entertainment facilities are located. Just around this area two local parking areas are established: one of them (about 50-60 cars) beside the main Hotel Mistral and the second one (up to 100 cars) – at the beginning of the pedestrian area in the promenade.

Both parking places are under guard's control. The second one (East) is paid and have manually operated barrier.

The entrance to the promenade at the other side (West) is restricted by a barrier operated by a guard. The guards are on 24 hours duty and belong to the local security firm. They are in close cooperation with the local police.

The pricing system is regulated by the decision of the local Municipality council. All regulations are under control by the respective directorate of the Municipality of Balchik. They are responsible about city logistics, local bus transport and all cars belonging to the Municipality. The town has only one underground car parking with a capacity of about 40-50 cars.

The only measures intended and implemented up to now are related to the tourist traffic limitations, development of the parking zones and regulated access areas for the hotels delivery logistics. The pedestrian areas are localized just near the sea shore – the Promenade tourist one (hotels and restaurants) and entertainment zone. The intension of the Municipality is to build some new parking places and to restrict the streets parking car by introducing a blue zone.

1.3 Balchik Study Areas

The studied areas include the main touristic and commercial part of Balchik.

Two main localities are outlined: (Appendix 1)

- Balchik town (divided to old and new part).
- Promenade area – with the main hotels, restaurants and attractions

1.3.1 Goods distribution scheme

The shops (and hotels, restaurants, etc.) are divided in several groups (see Table 1)

Table 1

Shops (hotels, restaurants, etc.)	Number	%	Location (old or new part)
Supermarkets	2	2	1 old part 1 new part
Small private shops (foods, drinks, ice-cream, etc.)	24	24	18 – old part 6 – new part
Beach supplies	5	5	4 old part 1 new part
Souvenirs	7	7	5 old part 2 new part
Light industry goods (electronics, house appliances, cloths, etc.)	8	8	4 old part 4 new part

Hotels	5	5	5 old part
Restaurants	14	14	9 old part 5 new part
Storages	1 huge	1	1 old part
Offices (admin., banks, posts, etc.)	17	17	13 old part 4 new part
Coffee shops	15	15	8 old part 7 new part
Total	100	100	

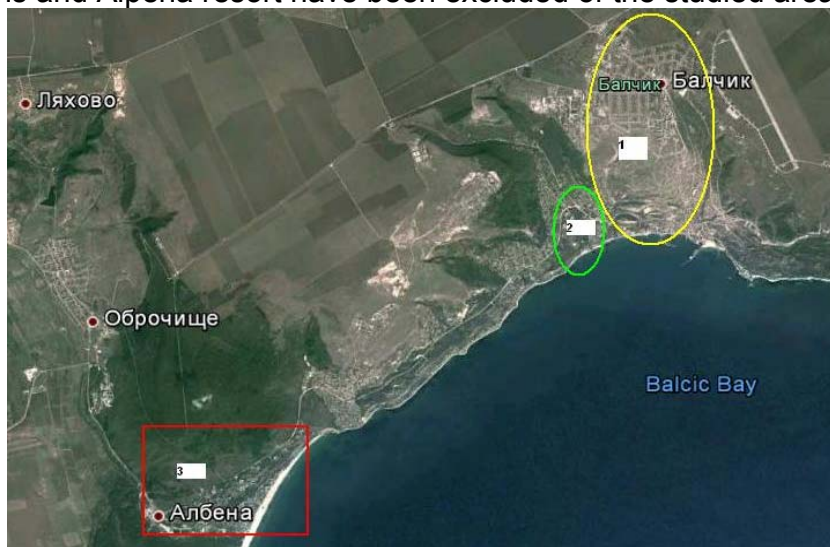
The delivery flows are going in two directions – to the old part and to the new one.

The main suppliers are private firms using light vans (LGV).

In the central part there are several office buildings within the study area including the headquarters of Balchik Municipality and underground garage for about 40-50 cars.

2. General logistics context

The study area covered the entire Balchik town and related with it local “villa - cottages” zones, which are incorporated. Then Queen Mary’s summer palace (the main historical site) and botanical gardens (like typical “green” zone) and Alpena resort as part of the Balchik municipality administrative ruled area are presented. After some discussions – both – Botanical gardens and Alpena resort have been excluded of the studied area.



Balchik town (1-yellow), green zone (2-Botanical gardens and Queen's palace (green) and Albeno resort (3-red quadrangle)

The focus of investigations is related to the coastal area – Balchik Promenade, where the main hotels, restaurants, shops and entertainment facilities are located.



An entertainment facility – Balchik Promenade

There are some limited specific regulations for commercial and freight vehicles circulation, entrance and parking. Almost all (4 for now) big hotels have their back yards access areas where heavy vehicles can temporary (juts for loading and unloading) stop. As the schedule is well known by the drivers, car traffic jam is practically not possible.

Some of the LGV – light goods vehicles (in general private) are entering the restricted zone from 6 to 9 AM and from 23 to 24 PM (changeable during the different seasons) just for fast loading/unloading procedures – mostly for goods supply – small industrial products like gifts, souvenirs and fruits and vegetables, as well as ice-cream.

The studied areas include the main touristic and commercial parts of Balchik.

Two main localities are outlined:

- Balchik town (divided to old and new part).
- Promenade area – with the main hotels, restaurants and attractions

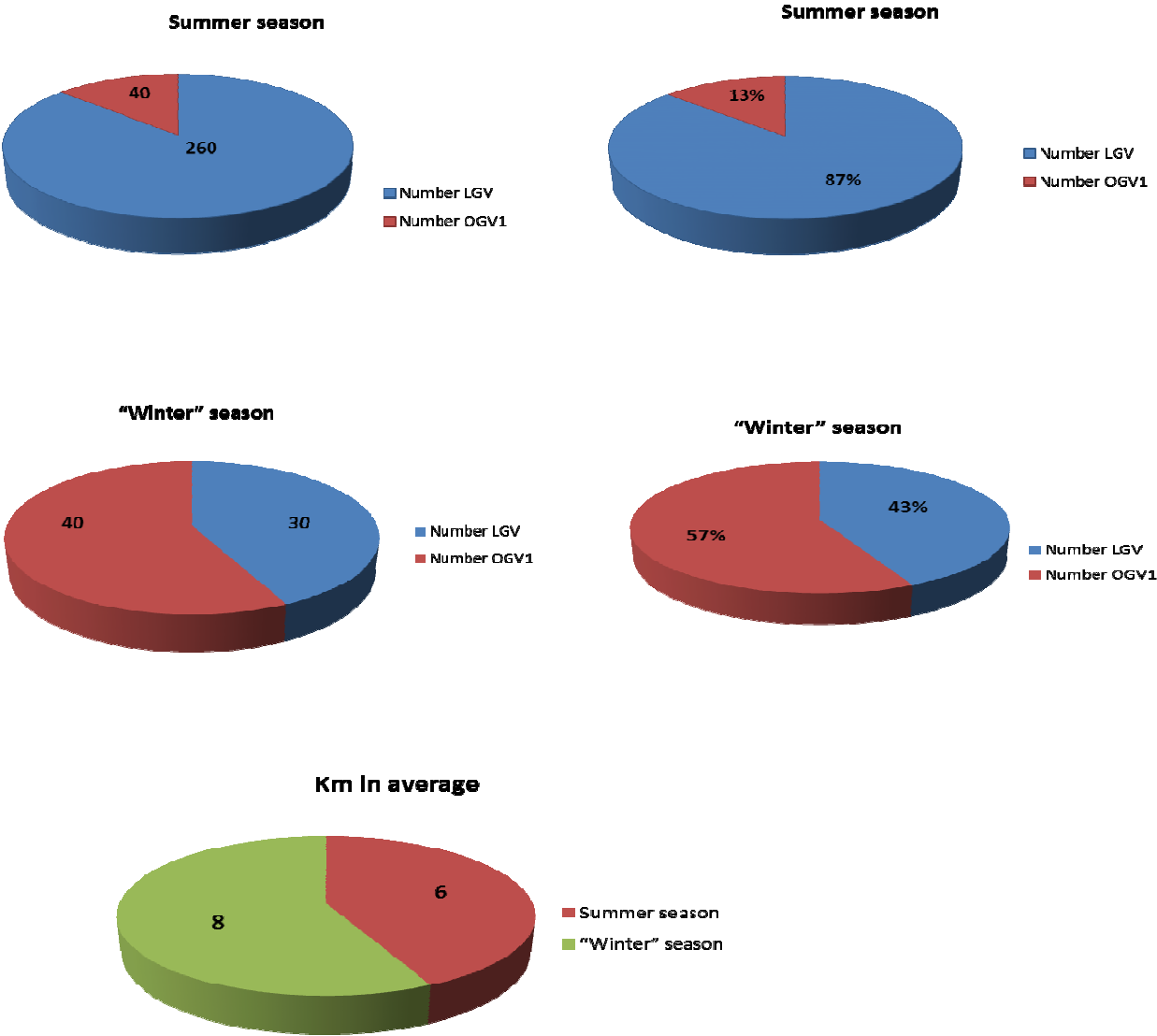
2.1. Specific regulations for commercial and freight vehicle circulation

There are no specific regulations governing commercial and freight vehicle circulation in the study area. These vehicles are subject to the small regulations outlined above that apply to all vehicles except buses. These are some distances of space that are available only for vehicles loading and unloading goods for hotels. Enforcement of the loading intervals are provided by the private security firm. The parking places are limited due to the topography restriction from the hilly and landslides activity.

2.2. Overview of main types of logistics flows

Traffic counts were undertaken during several days in tourist, intermediate and non-tourist season in 2012-2013 to determine the number of commercial vehicles entering the study area during weekends and working days. The total numbers of commercial vehicles entering and leaving the study area Balchik are:

seasonality	N# LGV	N# OGV1	Km average	in
Summer season	260	40	6	
“Winter” season	30	40	8	



Diagrams of the numbers of vehicles during the winter and summer season, as well the average kilometers of the respective types of vehicles traveling in the town.

Responsibility for organization of deliveries is generally through small private companies. They cover deliveries of about 76% of hotels and small shops located in the study area.

3. Setting logistics baseline

3.1 Commercial activities

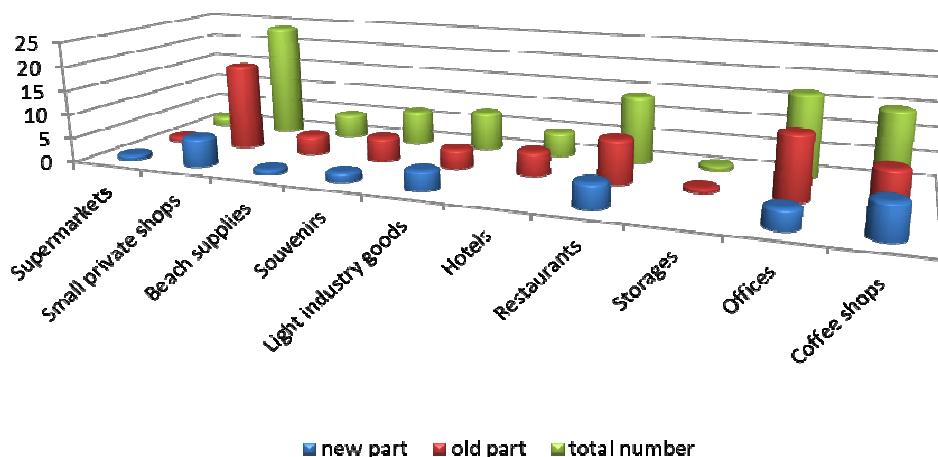
The commercial activities in Balchik are located in the two main parts of the town – the “old part” and the new part.

Due to its topography peculiarities – high hills moderated by the huge landslides, the old part is characterized by two main entrances/exits of the transportation roads and two secondary roads to the direction of Tuzlata. The streets are curvy and steep and can not absorb huge traffic. The only larger roads are around the sea and over the hills. They are responsible for the main traffic – tourist cars, LGV and OGV1 vehicles. In general the shops, restaurants and hotels are located near the sea shore. Predominant houses are between 1 and 3-4 stores.

The “new part” was build up during the 1960-ies and was related mainly with the military activity – the military and training base for air jet commands. The urban planning is modern and streets are straight. The building stock is mixed – higher blocks of flats (5-8 stores) and lower houses and public buildings – offices, schools etc.

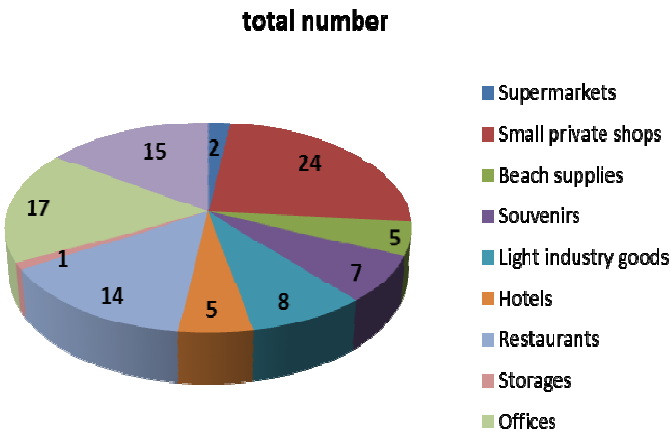
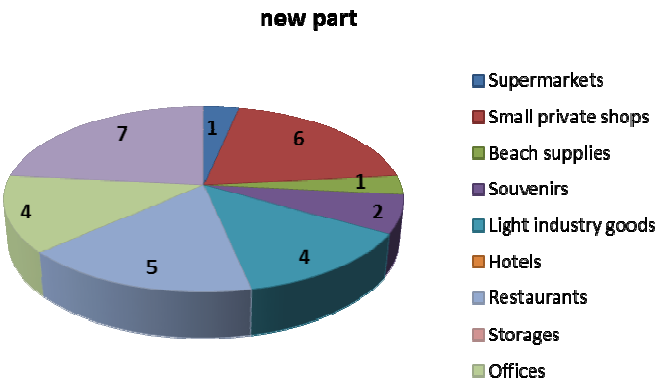
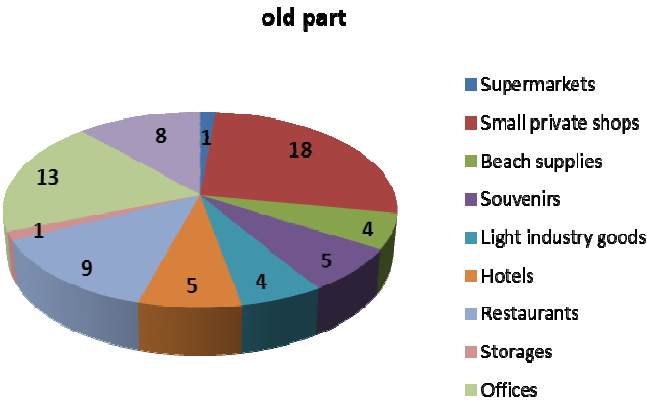
In both parts shops, coffee shops and other public buildings are located approximately equally.

The population is also distributed approximately equally – about 45% (old part) to 55% (new part). In general the shops, restaurants and hotels are located near the sea shore.



Distribution of the commercial activities in Balchik – new part, old part and total number

The number of the shops and other commercial units are presented to the following pies and diagrams:



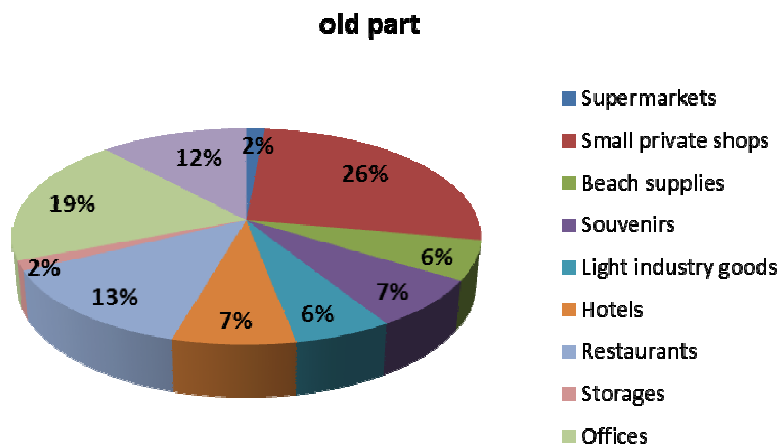
3.2 Goods traffic flows

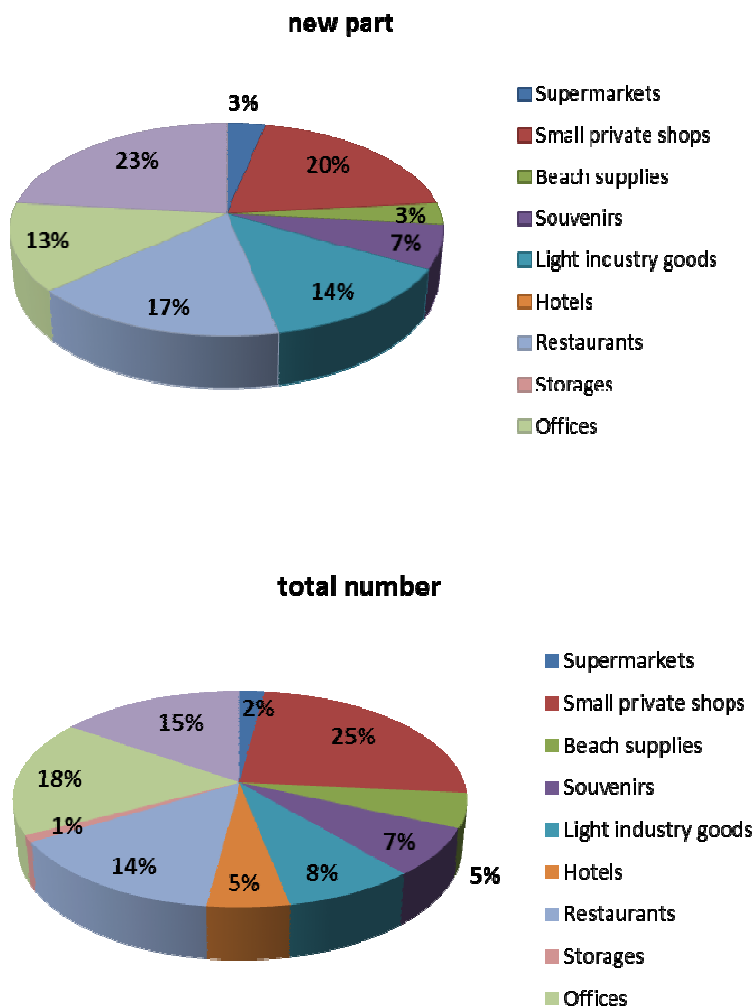
The goods traffic flows are directly related to the location and the number of the commercial buildings, shops, coffee shops (frequently placed in the street floors of the private homes), etc.

The delivery of the goods is executed by the private firms which have contracts with the shop owners. The time schedule is rather free and is arranged mainly for the big consumers like hotels and supermarkets – they are supplied in general each week to keep the vegetables, fruits, meat and other goods in fresh condition.

Distribution of deliveries in the town involved regulating the vehicles that enter the urban zone and assigning specific areas for distribution in the pedestrian and access restriction area. The end results are deliveries that are more methodical and less damaging to the surrounding environment

The following pies and diagrams show the percentage distribution of the different commercial units – both in the old and new part of Balchik.





The analysis of the figures above shows that the old part and the new part are almost equally supplied for the local food shops, coffee shops and supermarkets. The predominant number of the hotels, souvenir shops and beach supplies is related to the old part due to the tourist business and are located near the sea shore. These goods flows together with the huge corn storage and the offices covered more than 40% of the traffic flow near the shore.

3.3 Highlight logistics problems

To highlight the traffic and possible logistics problems the survey of the entering/leaving cars, LGV and OGV1 vehicles have been performed at the entrances/exits of the town (study area "entire Balchik") and Promenade (study area "promenade")

Traffic counts were undertaken during August and September 2013 in both study areas – Study area 1 – "entire Balchik" and study area 2 – "Promenade" to determine the number of commercial vehicles and tourist cars entering the study areas during weekdays (Monday to Friday) and holidays (Saturdays - Sundays).

The following abbreviations are used:

TC – tourist cars are included in the study, because they are the main traffic flow
Commercial vehicles were classified by two types, as follows:
LGV – light goods vehicles – comprising car derived vans and goods vehicles up to 3.5 tones.
OGV1 – 2 and 3 axle rigid vehicles over 3.5 tones GVW
Gross Vehicle Weight (GVW) (typically Ford Transit type vehicles)

The only two entrances and exits (main streets) in the study area make the counting procedure pretty easy and effective.



Typical delivery LGV for the hotels linen

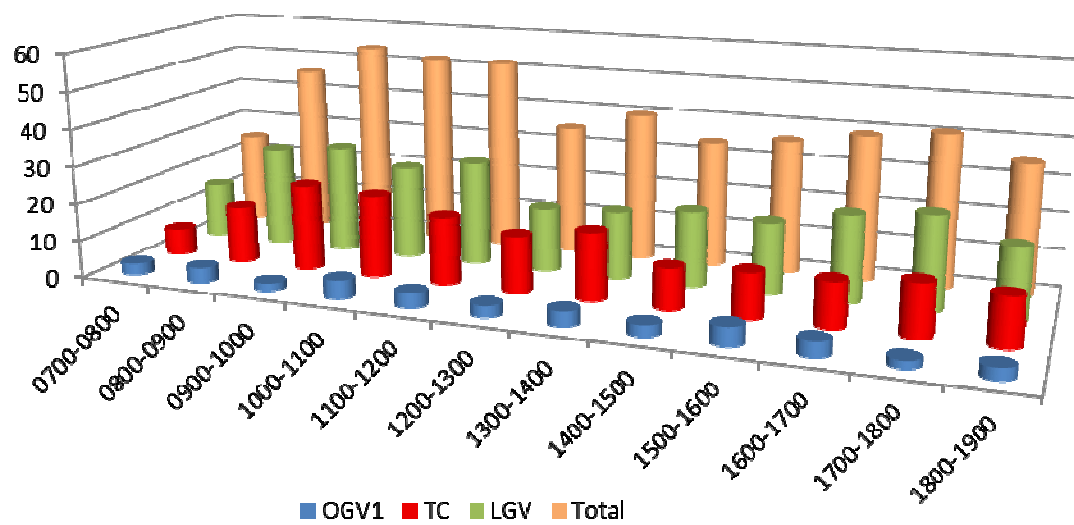
The counts were made for 60 minute periods over a 12 hour day from 07.00 to 19.00. (workdays - tourist season – entire Balchik) – Table 2

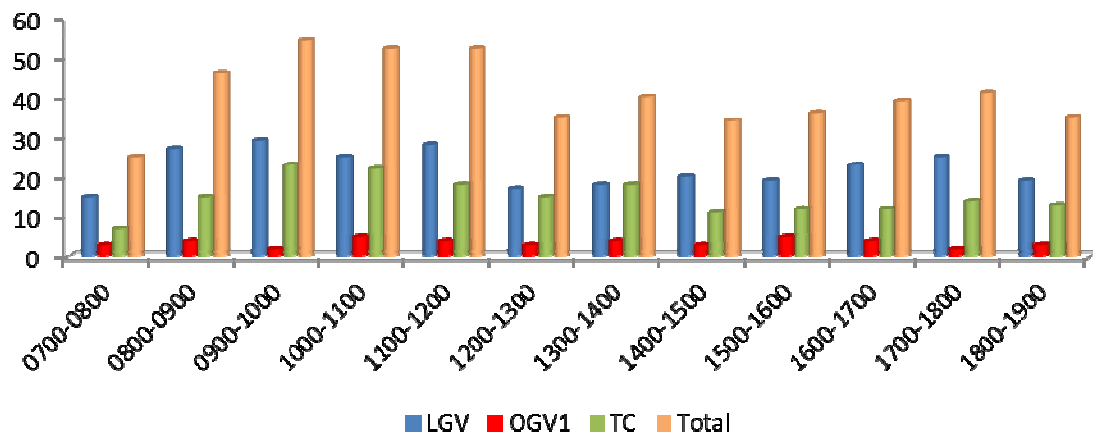
Table 2 – Numbers of cars for the study area “entire Balchik”

Time period	Number of vehicles			
	LGV	OGV1	TC	Total
0700-0800	15	3	7	25
0800-0900	27	4	15	46
0900-1000	29	2	23	54
1000-1100	25	5	22	52
1100-1200	28	4	18	52
1200-1300	17	3	15	35
1300-1400	18	4	18	40
1400-1500	20	3	11	34

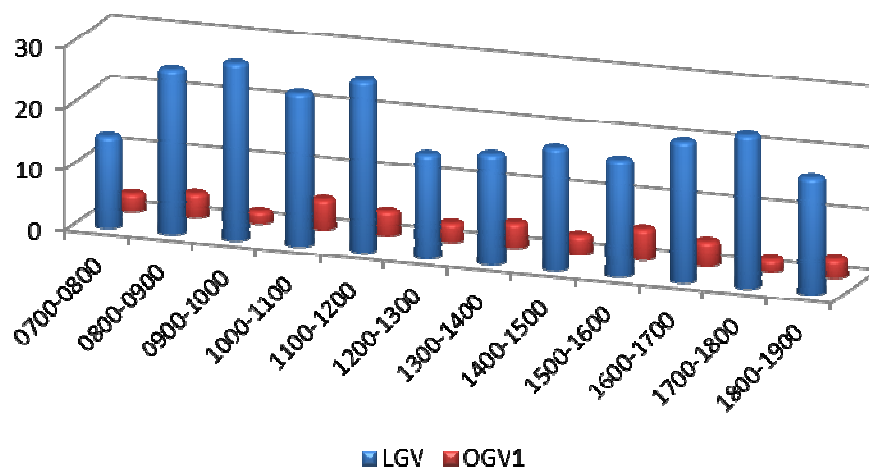
1500-1600	19	5	12	36
1600-1700	23	4	12	39
1700-1800	25	2	14	41
1800-1900	19	3	13	35
Total	265	41	182	488

The traffic flows are presented by the following histogram and diagram.





To separate the tourist cars (they are the main component of the traffic flow), the LGV and OGV1 vehicles have been counted. The results are presented to the next diagram.



The analysis shows that these flows (LGV+OGV1) formed more than 70% of the CO₂ emissions. This is approximately constant value. It changes mostly during the summer time, but not more than 10-15%.

To investigate the seasonality distributions additional investigations have been performed during the winter season in Balchik - 2013. The seasonality of the tourist activity has been studied, about "winter" (called calm tourist season) and "summer" – called active tourist season and CO₂ emissions calculated. Table 3.

3.4. Calculations model

The data related to the daily traffic in the study area extended to all vehicles (cars and commercial vehicles) are very useful. From these data we calculated the baseline (CO₂ emission and energy) which shall only refer to logistics activities. For this purpose we indicated the data that we have already assumed for commercial vehicles (diesel vehicles Euro 2-3). We consider these averaged values are suitable):

-Emissions :

OGV1 : average experimental consumption = 6 Km/lt ; CO₂ emissions = 0,433 gr/Km

LGV : average experimental consumption = 8,3 Km/lt ; CO₂ emissions = 0,342 gr/Km

Diesel specific gravity = 0,835 Kg/lt

-Energy:

1Kg diesel = 10.200 Kcal

For the calculation is possible to estimate how many kilometres a commercial vehicle run in average within the Study Areas.

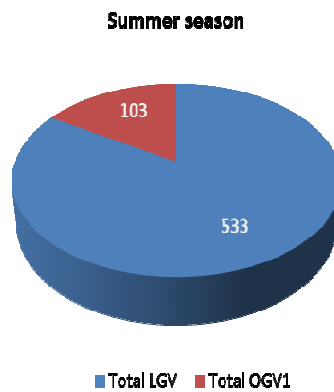
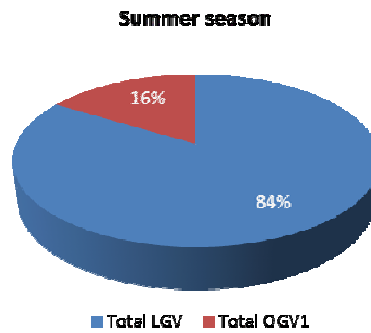
Estimation of the average consumption of the LGV and OGV1 – Table 3

Table 3. Seasonality rate of average numbers and kilometers of LGV and OGV1 with the CO₂ emissions

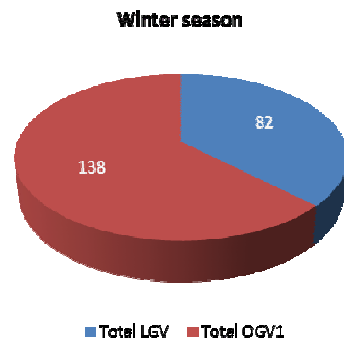
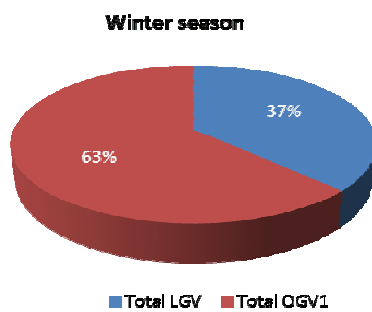
seasonality	Total LGV/OGV1	CO ₂ emission
Summer season	1560/240	533/103
Winter season	240/320	82/138

Furthermore, since the baseline must be calculated on a seasonal basis, the available data for commercial vehicles on a summer/winter season have been extrapolated to the seasonal basis.

It was established that during the “winter” (non tourist) season the traffic of LGV decreases approximately 10 times. The heavy vehicles – OGV1 we kept in an average year basis having in mind that the intensive traffic is for about 2-3 months for the corn production export period trough the port.



CO₂ emissions during the summer season



CO₂ emissions during the winter season

Table 4. Numbers of vehicles in the Study area – “Promenade” (workdays-tourist season)

Time period	Number of vehicles			
	LGV	OGV1	TC	Total
0700-0800	2	1	0	3
0800-0900	3	1	0	4
0900-1000	2	2	0	4
1000-1100	2	0	2	4

1100-1200	2	1	1	4
1200-1300	1	0	1	2
1300-1400	1	0	0	1
1400-1500	0	0	0	0
1500-1600	0	1	1	2
1600-1700	2	0	0	2
1700-1800	2	0	0	2
1800-1900	1	1	1	3
Total	18	7	6	31

During the out of tourist season time ("winter") this area is fully free of any transportation.

There is no any air monitoring sites located in the study area to record air pollution.

4. Candidate Measures/services identification and selection

4.1 Analysis and Identification

After the analysis is performed the following conclusions could be extracted:

- All road space in the study area is regulated by means of Traffic Regulation Orders (TRO), drawn up by the City Council under the auspices of national legislation and is subject to enforcement by City Council-employed Parking Assistants. The TROs define the times that parking or loading/unloading are permitted or restricted and the types of vehicles that can park or load/unload there. These are backed up by traffic signs.
- The main Promenade street is pedestrianised with restrictions on access for vehicles and are landscaped to restrict vehicle speeds and discourage general traffic use. Primorsky boulevard is the main supply road and passes paralely to the Promenade pedestrian aley. The main parking places in the old part are located near the street.
- The retail businesses on the pedestrianised streets are dependent on front-door deliveries with time restrictions in place from 6.00 till 9.00AM. The back door delivery time of the hotels have off-street servicing areas which can be accessed without time restriction. Elsewhere in the city centre designated loading bays provide access for retail and office properties.
- There are not very much trafic difficulties in the town. The streets' network can absorb the main trafic flows. The only heavy problems could exists during the intensive tourist season (July-August), so the new parking places are intended to prevent the entrance of overloaded tourist cars flow.
- The polution generated by the trafic flows is not measured up to now. All calculatiuopns are made on a model basis. The wind environment usually prevent the heavy gas polution in the town.

- Intelligent Transport Systems (ITS) have been proposed to Balchik Municipality according the ENCLOSE working plane, but after discussion rejected due to the lack of funds. The Municipality controls the city's traffic signals, including bus priority, variable message car park signs, and parking places ensuring the efficient movement of traffic and the provision of transport information within the city.

4.2. Selection of the most suitable measures

On the basis of the above presented results, several soft measures have been identified, discussed and implemented. All soft measures have been divided in several groups:

4.2.1. Soft measures proposed and implemented

Two soft measures have been identified for application in the Balchik study area. These are:

- Time limitation of vehicles access to the hotel area near the sea-shore
- Space limitation of vehicles and tourist cars

4.2.2. Extra soft measures have been identified and implemented – in the “Promenade” area:

- there is 1 guarded barrier on the entrance to the seashore pedestrian area
- 2 parking places – 1 life guarded and 1 guarded with barrier

4.2.3. Soft measures intended to the near future, to be implemented

- Extension of the time and space limitations to the new hotels deployed around the Promenade (this measure is obligatory, as the extension is going to the opposite direction of the present Promenade pedestrian area)

This measure is due to the new building constructions. Most of them are under the stage of final works, so very soon the access to them will be restricted by time for the delivery of any goods and supply.



The new construction of the future hotels – other side of the Promenade

4.2.4. Parking places locations and construction

The highest difficulties in the city logistics are related to the limitations of the parking places. Due to the very hilly and steep slopes in Balchik, dominated by local landslides, the space of the parking places during the summer times is very limited. To eliminate these difficulties there are several new established parking places, but they can not ensure the increased tourist traffic during the summer time. A measure proposed is to build up new parking places near the entrances of the town. They are located to relatively flat areas, where the construction of such large parking places is possible. This can ensure the soft traffic during the tourist season for the crossing tourist vehicles. The aim is to limit the access during the heavy traffic hours of the commercial vehicles and the other traffic. Such measure is effectively implemented to other seaside towns (Sozopol, Nesebar, etc.). The problem is still the lack of money for such huge investment.

5. Cost and impact dimensions

The expansion of the soft measures (space and time limitations) to the other side of the Promenade (new hotels, restaurants and entertainment facilities) needs some small additional funding:

Due to the easy adaptation of the surrounded area of an existing facility to this purpose the general measure could start with a low investment cost. This will be helpful to make the activity economically self-sustainable.

5.1. Needed funds for a contract with the security firm
(as like a present contract)

Costs/year €

The contract with a security firm – 35 000 EURO (equivalent to 70 000 BG leva)

5.2. Needed mechanical equipment: (the minimum equipment should be bought):

Costs/year €

1. 1 barrier equipment – 1500 EURO (3 000 BG leva)
 2. 1 box - for guard cabin – 2000 EURO (4 000 BG leva)
 3. 1 C/C (coordination) center - hardware only – 5 000 EURO (10 000 BG leva)
- The maintenance cost (1.+2.+3.) – 10% - 850 EUR (1700 BG leva)
-

Total: 9350 (EUR) – (eq. 18 700BG leva)

Costs/year €

5.3. Needed consumables:

3-5 new cell phones for the new guards – 1000-1200EURO (2 000 - 2 400 BG leva)

The permission cards to the delivery cars – 500 EURO (1000 BG leva)

Total: 1500 EUR (3000 BG leva)

6. Conclusions

The feasibility study for town logistics measures in Balchik shows that the selected measures could positively influence the decrease of CO₂ and other pollution gases emissions. It can cover the investigated categories – commercial, transport, operational and technical in which the ENCLOSE project focus. Its purposes by all means represent an added value in environmental and energy terms of the town

The first measure to set up would be the adaptation of the Promenade implemented measure of guarded barriers to the extension to the new build hotels, restaurants and entertainment facilities, which could lead to an improvement of urban sea shore area and to the life quality.

Any of the other three measures could be implemented. The experience of the implemented temporary soft measures shows that the time and space limitations could be useful, but also create some difficulties to the citizens of the town. It will be responsibility of the Municipality Council to decide the measures prolongation or to try to introduce some others.

In short, it is important to highlight that in general Balchik town there are not strong logistics problems. In any case, this feasibility analysis enhances the progress on the habitability of this town – the old central part and the new tourist area near the sea shore. The collaboration between the Municipality authorities

and the citizens – as well as the transport operators and tourist industry could be improved in search of the optimal solutions of the town logistics.



Balchik Promenade – alley, hotels, restaurants, entertainment facilities – the pedestrian area

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