Measure title: **New goods distribution scheme in Krakow**

City:	**Krakow**	*Project:*	**Caravel**	*Measure number:*	**10.3**

A Introduction

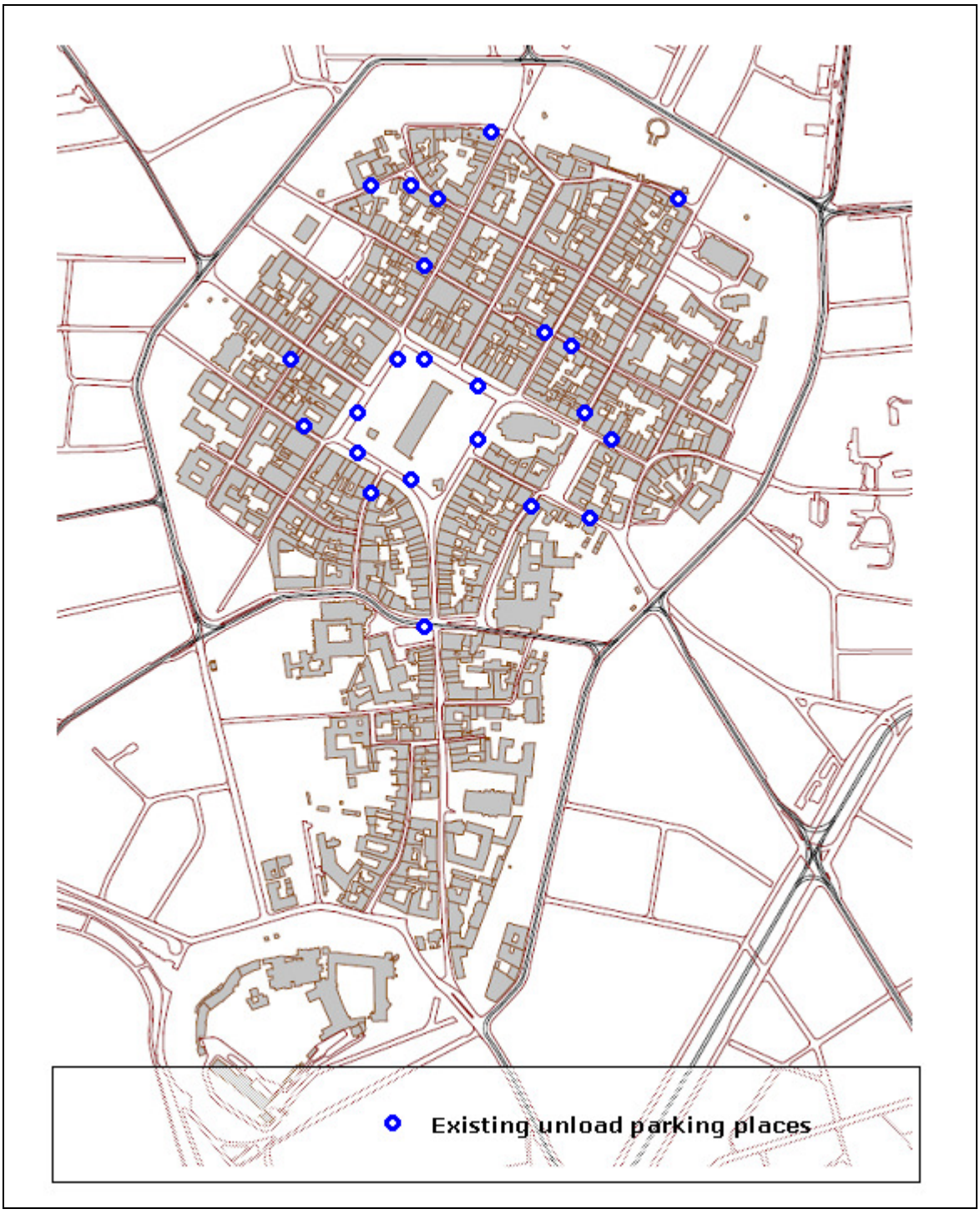
A1 Objectives

The measure objectives are:

- To develop a coherent access control system for goods vehicles entering protected zones
- To establish an efficient goods distribution in protected zones (100% clean vehicles)
- To improve quality of goods distribution
- To achieve wide social consensus for goods vehicle access restrictions
- To implement a system of distribution of goods by clean vehicles
- To decrease amount of private carries entering old city centre
- To better organise distribution of goods in the city centre

A2 Description

The objective of this measure is to change the present situation of goods distribution to the city centre.
Now the distribution of goods is made in time-windowed entries into the pedestrian or restricted area leading to considerable congestions.
What needs to be done is a new organisation of the system, so that pedestrians, especially tourists could fully enjoy one of the largest market squares in Europe. In order to achieve this, the city of Krakow will develop a new scheme of goods distribution, with usage of clean and more environmentally friendly vehicles. Initial implementation will be made within the city centre – on the Main Square area, inside 1st ring (Planty), located in the pedestrian zone. With the goods distribution system, the private delivery service in the old city centre shall be reduced by about 50%.
The new organisation of the system will be based on collecting the mobility credit points from every goods distribution vehicle starting unload operations on the Market Square. The points given to every carrier depends on time of delivery, and kind of engine (fuel). When the goods distributors will adopt to new regulations, they do not need to pay any additional costs. If carriers are not willing to change their habits, they have to buy additional mobility points or are not able to reach the Market Square in some periods of the day.


Existing unload parking places

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **Use of new technology/ITS** - Access control technology to support the adopted regulations of access of goods vehicles will be based on innovative solutions (i.e. special license plate identificating camera or PDA collecting mobility points).
- **New mode of transport exploited -** Nowadays the access to the Market Square is not limited to environment friendly modes of transport. According to the measure, clean vehicles will be used to distribute goods inside the Market Square in Krakow.
- **Policy innovation –** The carriers adopted to our proposed environmental friendly system are able to reach exactly to the Market Square, and even without additional payment. It may be seen as new policy, promoting "green" suppliers. It is not contained in nowadays working time-windowed solution.
- **Economical innovation** – The approach we chose here is not based on penalties, because free carriers are possible as well, according to our rules. It is rather promoting of those, who are willing to change their habits of distributing goods to the city centre.

B2 Situation before CIVITAS

Now in city centre of Krakow, distribution of goods is made in time-windowed entries into the pedestrian or restricted area. At the beginning of the project, 19-10 h was the time, when goods distribution was allowed. Now, 23-10 h is the time period proposed for supply activities. It is often observed that in that time the Market Square is congested and full of delivery vans, which effects in noise, air pollution and decrease of attractiveness of old city centre for tourists and inhabitants. No environmentally friendly regulations are imposed to delivery vehicles. Any kind of support to those of carriers, who are willing to innovate and reorganise their work.

B3 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: Scheme design of the goods delivery concept in Krakow *(01.08.2006 – 31.12.2006) – A 10.3.1"New distribution scheme in Krakow" was created. The document was based on the experience of Genoa.*

Stage 2: Meetings of all potential stakeholders of the project (e.g. Mobility Forum) (*01.08.2006 – 31.12.2008) – As a result of stakeholders' meetings, a Mobility Forum was organised, where all the stakeholders could exchange their opinions and suggestions. The stakeholders consist of carriers, shopkeepers, Market Square area managers and city logistics experts.*

Stage 3. Changing the approach of the goods distribution system

(01.10.2007 – 01.09.2008) – Genova as well as Kracow decided to discard the HUB-based solution and started to work on new concepts. In Krakow it was strongly correlated to huge critics on the scheme, during the Mobility Forum, organised in 09.2007. The time-consuming consolations with experts and stakeholders started. New scheme with mobility credits was created and discussed with interested parties.

Stage 3: Launch and test operation of the system for freight distribution, calibration, control, etc *(01.09.2008.-.31.01.2009) – Preparations to the start are still being in progress. The run is planned on December 2008.*

B4 Deviations from the original plan

The deviations from the original plan comprised:

- **Delay of the launch and test operation of the system** – The 2- month delay of the start is connected with the reorganisation of the Municipality Department, responsible for the measure.
- **Change of the approach of the new system** - The change of the approach forced as to creating the completely new scheme. This meant 6 months delay with of the start of the system.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **6.4 Enforcement of access restrictions in Krakow** – Relation with measure 6.4 is based on the study on how to use of electronic identification system with relation to goods distribution scheme
- **11.7 Mobility Forum in Krakow** – Involving shopkeepers as well as other stakeholders within the Forum to discuss goods distribution problem and present objectives of the measure. Forum took place in September 2007.

C Evaluation – methodology and results

C1 Measurement methodology

C1.1 Impacts and Indicators

Table of Indicators

Evaluation Category	N°	Indicator	Units	Source of data	Methodology for indicator construction (survey, modelling, etc)	Baseline date
Economy	2	Operating costs	€/pkm	UMK[1]	Modelling	6/2007
Energy	3	Vehicle fuel efficiency	MJ per vkm	UMK	Modelling	6/2007
Environment	12	Noise perception	%	UMK	Survey	6/2007
	Own	Environment's improvement	%	UMK	Modelling	6/2007
Society	14	Acceptance level	%	UMK	Survey	6/2007
	Own	Acceptance level of shopkeepers	%	UMK	Survey	6/2007

[1] UMK – Urzad Miasta Krakowa – Municipality of Krakow

Transport	25	Freight movements	No	UMK	Survey	6/2007
	Own	Rotation of goods vehicles	No or %	UMK	Survey	6/2007
	Own	Number of waste disposal vehicles	No.	UMK	Survey	9/2007
	Own	Reduced goods vehicle movements	%	UMK	Survey	6/2007

Detailed description of the indicator methodologies:

- **Operating costs** – Operating costs were obtained from medium-sized operators, who are the most popular on the specified area. The Cost is defined as the ratio of total operating costs incurred by service. Modelling enables the extrapolation of the values, so that it is possible to obtain the whole image of situation.
- **Vehicle fuel efficiency –** Data are collected through modelling. Indicator is defined as the energy consumption per unit of transport activity. Vehicle fuel efficiency is equal to total energy consumed for the vehicle, divided by total amount of vehicle-kilometres completed by the vehicle. To the model, the most popular vehicle models used in goods distributions are used (based on the field survey). The values of fuel consumption are known from the operators as well as car producers information.
- **Noise perception –** Data were collected through survey among residents and shopkeepers. Respondents were asked to point out the noise level on the scale. As in other surveys in the measure, sample size was 300, what is equal to 5% of sampling error.
- **Environment's improvement –** Indicator is defined as the estimation of influence of less number of goods vehicles on environment quality in the demonstration area. It is mostly based on the survey showing, how many cars reach the specified area.
- **Acceptance level** – Data were collected through survey among residents, pedestrians and shopkeepers (sample size - 300, sampling error 5%)
- **Acceptance level of shopkeepers –** Data were collected through survey among residents (sample size - 300, sampling error 5%).
- **Freight movements –** Data were collected through survey among shopkeepers and measurement as well. Indicator is defined as a number of movements per day.
- **Rotation of goods vehicles –** Data are collected through survey among shopkeepers or measurement.
- **Number of waste disposal vehicles** - Obtaining number of disposal vehicles from operator.
- **Reduced goods vehicle movements -** Data are collected through survey among shopkeepers or measurement; it is a percentage of reduced goods vehicle movements in the demonstration area.

C1.2 Establishing a baseline

Till the start of Civitas project, the City Departments responsible for managing the old town area as well as Market Square were trying to solve the goods distributions problem only on time-windowed solutions. The negotiations among stakeholders were limited. The opinion of shopkeepers were supported by City Councils, which are against changes in goods distribution system. As the survey results before show, public perception of the problems caused by carriers is not perceived as important. Noise generated by distributors in early morning hours is not seen as a problematic as well. Our measure was the first effort of solving the city logistic problem in more complex way. It was one of the reasons why consultations and meetings among stakeholders took so much time.

C1.3 Building the business-as-usual scenario

If measure wouldn't be implemented, the present time-windowed solution would be the only kind of regulation of goods distribution. According to very small awareness of the problem in City Council as well as Municipality and strong lobby of shopkeepers, the system would not be changed into more restricted. Inhabitants are not interested in logistics problem as a priority so no pressure on administration would be found.

C2 Measure results

The results are presented under sub headings corresponding to the areas used for indicators – economy, energy, environment, society and transport.

C2.1 Economy

The economic modelling have not been implemented therefore the result cannot be discussed here but from economic point of view the new system can be more costly for shopkeepers regarding the fact that it got more restricted period to have their delivery and suppliers can increase the prise due to new regulations of late deliveries and at the other hand the charges for deliveries during forbidden period have been increased.

C2.2 Energy

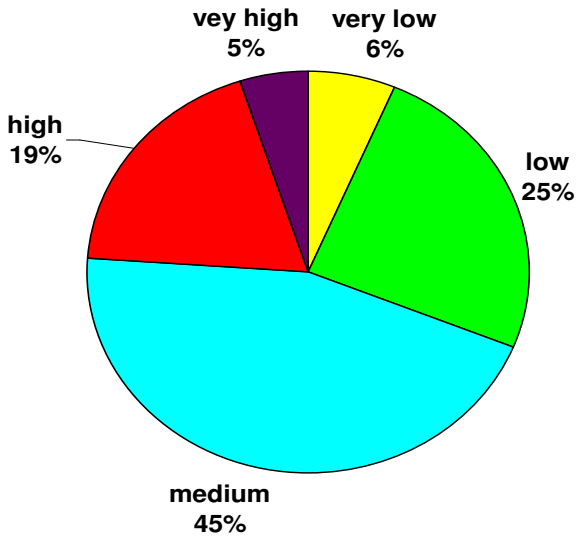
The energy modelling have not been done therefore the result cannot be discussed here but regarding new regulations related to using clean vehicles to distribute goods in city center decrease in fuel consumption can be expected.

C2.3 Environment

Nowadays no environmentally friendly regulations are imposed to delivery vehicles in city center but according to the measure, clean vehicles will be used to distribute goods inside the Market Square in Krakow which lead to more environmental friendly situation.

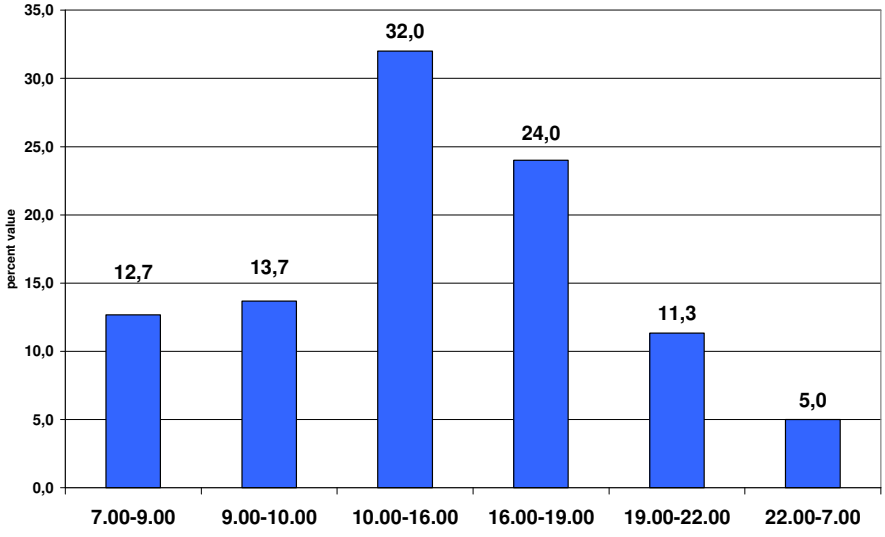
The noise level were described through surveys from inhabitants and tourists and shopkeepers which shows that noise level for 24% of repliers is almost high or very high.

Noise perception



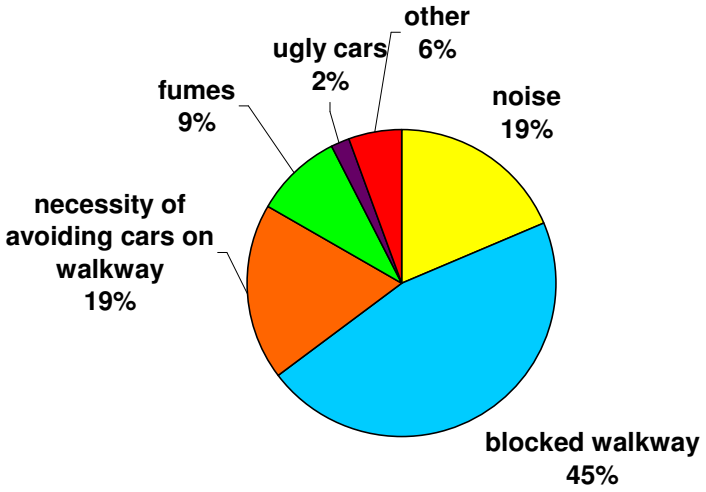
C2-3-1. "How would You describe the noise level, generated by cars on the Market Square?"

The repliers were asked also about period of the day, where in their opinion the noise has the highest level. Over 32% of respondents have chosen 10.00 – 16.00. Because the survey was based on the opinions of shopkeepers as well as the inhabitants and tourists, it shows rather than noise of the goods distribution is not perceived as problematic. Nevertheless even if awareness of the importance of city logistic solutions is not high, it may be also the result of poor dissemination campaign.



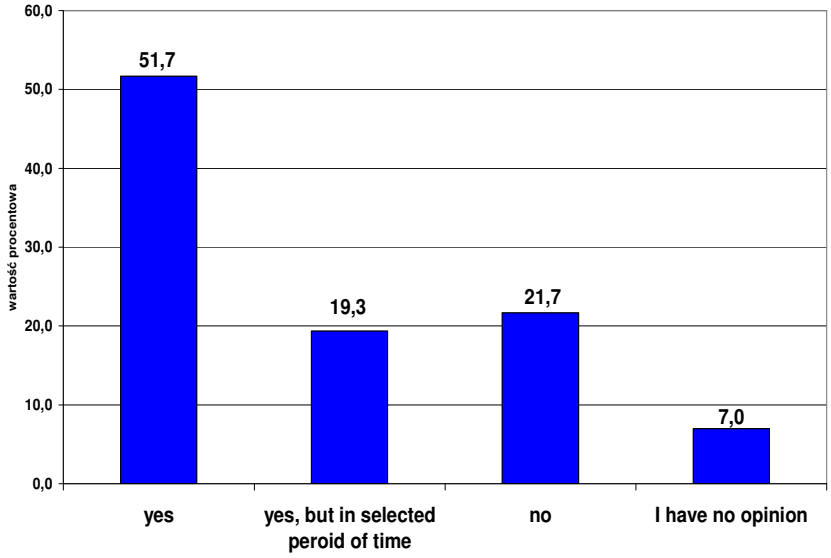
C2-3-2. "When the noise level is the highest?

It can be seen from the survey answers that public support for the measure is theoretically possible, because blocked walkways in the pedestrian priority zones is a strong argument for changing the present situation.



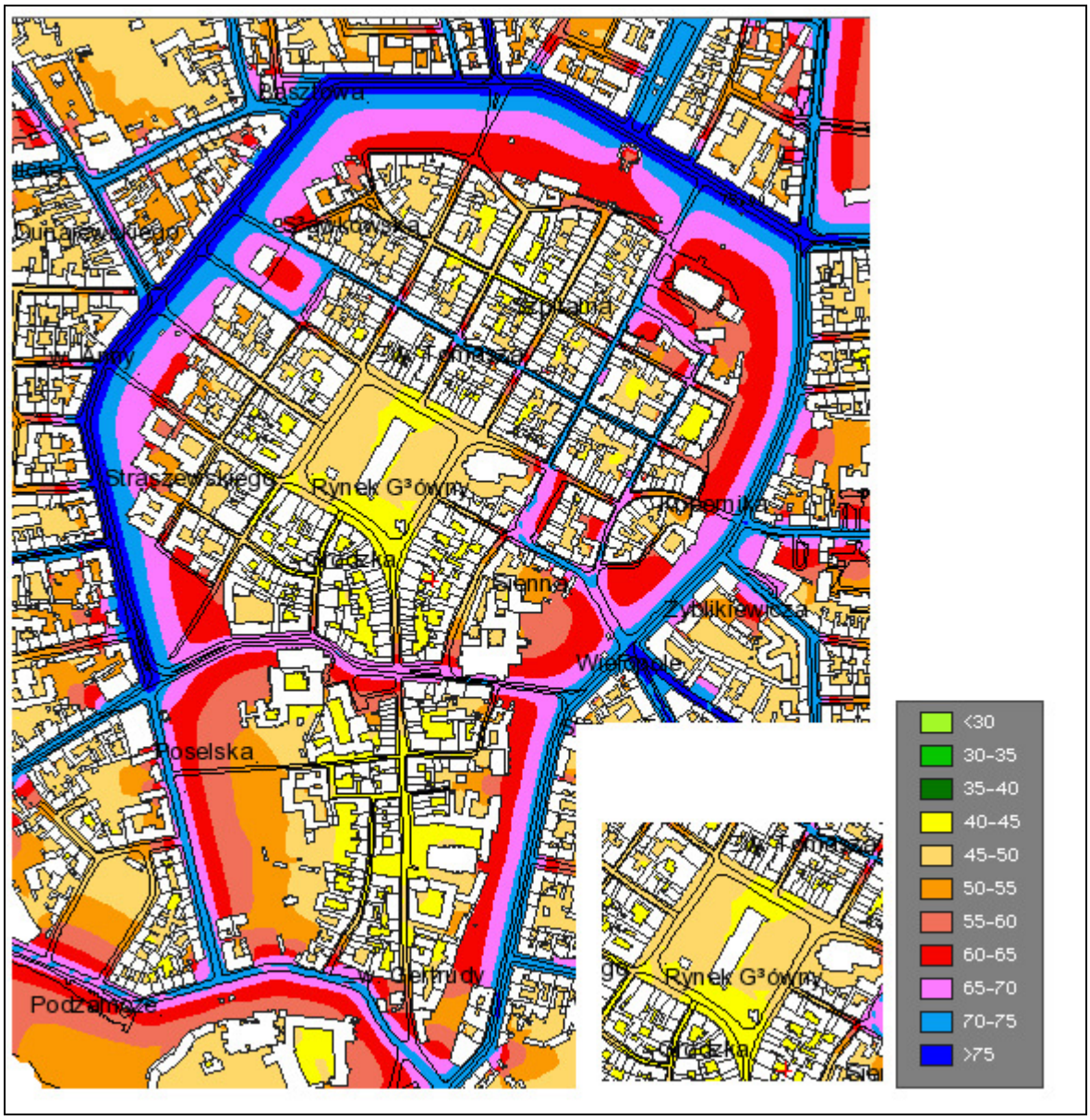
C 2-3-3 –"What disturbs you the most?"

The suspicion from above question can be approved in the answers presented below.



C 2-3-4- "Do you think that cars parked in the centre make walking difficult?(from surveys' questions)"

As the acoustic map of Krakow shows, the biggest problem of traffic noise can be seen on the road around the specified area. On the Market Square, situation is much better and refers mostly to deliveries.



C 2-3-5- Acoustic map of the Old Town of Krakow, with the focus on Market Square Area [db].

C2.4 Transport

Transport in the demonstration area may be affected by the limitations, according to regulations specified below. This is the scheme of the possible credit points, which are the basis of the project. Nevertheless, changes are limited only to those, who entry on the Market Square and still are discussed among stakeholders. It will be also the topic of the Workshop organized on the Technical University in December.

Fuel	*Entry time*	*Amount of credit points*
Electric car	*23.00-7.00*	*0*
Electric car	*7.00-9.30*	*2*
LPG/CNG	*23.00-7.00*	*5*
LPG/CNG	*7.00-9.30*	*10*

ON/95/98	*23.00-7.00*	*15*
ON/95/98	*7.00-9.30*	*30*

C2.5 Society

Regarding that the system has not been completely implemented yet the influence on society cannot be discussed here.

C3 Achievement of quantifiable targets

No.	Target	Rating
1	To establish efficient goods distribution in protected zones (100% clean vehicles)	
2	To implement a system of distribution of goods by clean vehicles	
3	To decrease amount of private carries entering old city centre	
4	To protect the near curb space for delivery vehicles	
NA = Not Assessed ★ = Substantially achieved (i.e. at least 50%) ★★= Achieved in full ★★★= Exceeded		

C4 Up-scaling of results

Problem of goods distribution concern not only the historical City Centre but all streets in the 2nd Ring Road. Up-scaling of results received in the measure demonstration area might be a good argument for extension of the new distribution zone to the 2nd Ring Road, which practically is a boarder of the Krakow Inner City. Implementation should consist installation of the access control system on every entrance to the Inner City. Future development of the pedestrian zones on radial market streets going between 1st and 2nd Ring Road, which is almost settled, force changes in distribution goods system in this area, thus up-scaling of results might be a good solution.

C5 Appraisal of evaluation approach

Indicators chosen to evaluate the measure were selected in appropriate way and exactly fit the needs. Nevertheless, the changes in the project scheme may affect somehow the results. That is why the evaluation approach must be extended.

C6 Summary of evaluation results

The key results are as follows:

- **Key result 1** – It seems that 'Noise' is not the main problem for people in the city center and the biggest problem for inhabitants and tourists is the system of car parking's, the system which allows people to park their car in the pavement. According to surveys 64% of the citizens consider this system as the most annoying problem in the city center and only 19% of them chose noise as their disturbing point.
- **Key result 2** – Based on the results from the survey the periods with highest rate of noise are 10.00-16.00 and 16.00 up to 19.00 which means that the noise is not perceived by inhabitants and tourists as a problem connected with deliveries. At that time goods distribution on the Market Square is forbidden, so the noise is connected with usual daily activity.

D Lessons learned

D1 Barriers and drivers

D1.1 Barriers

- **Lobbing by shopkeepers from the city centre in City Council against new distribution of goods system –** new system is perceived as a complication and its cost-effectiveness is doubtful. During the meetings among stakeholders, independent logistic expert was invited to show what are the advantages and disadvantages of different solution. It helped much, because Municipality workers were perceived as to much involved in the project and not really objective. Still City council is not satisfied with the possible solution based on mobility points.

- **Lack of sub-contractor for this kind of service –** this refers to the idea of the HUB-based system proposed in the first stage of the measure.

- **Low number of people working for the measure** – it is connected with problem of too little person-months, what triggers in not enough possibilities of implementation; another problem is that if only one person is working on the measure, it is very difficult to continue a process by others during leaves of the measure leader etc. What is very difficult in terms of too little people working on the measure is when the measure leader changes his position, almost all the process of cooperation has to be started from beginning (example from this measure).

D1.2 Drivers

- **Increasing number of foreign tourists visiting Krakow –** according to increasing number of tourist visiting old part of Krakow, pressure on the Municipality in terms of creating attractive image of the town is bigger (delivery vans are not demanded in the city centre).

- **Concentration of the deliveries in short time, what results in congestion –** survey prepared by Municipality shows that the congestion on the Market Square is visible and that is why our solution proposed concentrates on the decrease the peak of deliveries and promotes carriers entering earlier.

D2 Participation of stakeholders complete

- **Stakeholder 1 -** City Centre inhabitants – participation in Mobility Forum
- **Stakeholder 2** – External experts, from Katowice and Wroclaw – audit of assumptions
- **Stakeholder 3** – Shopkeepers associations – participation in Mobility Forum, evaluation of assumptions, nevertheless their activity was also focused on protesting and disagreement with the basic assumptions of the measure.

D3 Recommendations

- **More than one person cooperating/ bigger number of person-months –** If the measure has the stage of implementation, it is crucial to work on it with more than one person cooperationg with measure leader. Without it we can not implement all what was planned.

- **Bigger involvment of private companies and NGOs as project partners** – Due to beaurocratic organisation of work in such partners as a Municipality

departments or Police, the role of much faster working and easy decision-making organizations (NGOs, private companies) should be much bigger. It would make work for municipality more easier and influenced on more creative thinking among stakeholders. Maybe it shoul be even obligatory to involve such an organisation like local NGO to the project.

- **Dissemination should cover also the media patronats** – Massmedia are one of the most important ways to comunicate to inhabitants. But if the journalists are not aware of the main objectives of the measure, the information which residents recieve is often of poor quality. The best way to show to journalists what is the project/measure about is to involve them to cooperation, for example as the media patrons.

D4 Future activities relating to the measure

In accordance with much delay in the measure implementation, the process of changing the goods distribution system in Krakow has to be continued after the project life-time as well, taking different possibilities and solutions (maybe even not mentioned in the MERS) into consideration. Nevertheless one of the most important aspects is to strengthen the cooperation opportunities among stakeholders (common initiatives etc.) and try to influence on the resident/politicians awareness of the issue importance. The debates and information campaigns should be organised to show that city logistics may trigger many positive results on many fields.