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Stakeholder segmentation: different views inside the carriers group

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Abstract

The use of multi-actor multi-criteria methodologies is widely accepted to evaluate city logistics policies and measures. We have applied this procedure to the proposal of implementation of two alternative measures in a fresh food market in the Seville city center, after gathering all the relevant data from a survey passed to the retailers working in the premises. After perceiving that the quantitative results did not provide an appropriate representation of the existing scenario, we segmented the carrier stakeholder group into two smaller independent groups, obtaining more homogeneous results in the quantitative analysis and a better representation of reality. The segmentation of stakeholder groups appears then as an interesting requirement for this type of analysis to better serve as a decision-making tool for policy implementations.

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Keywords: city logistics; cooperation; evaluation; stakeholder group

1. Introduction: evaluation techniques for city logistics projects

The evaluation, either ex-ante or ex-post, of city logistics implementations requires to take into account the opinions and perceptions of many different stakeholders. After all, implementing any urban freight initiative is linked to an alteration of the balance of urban space and/or economic resources among the different groups competing for it: drivers, residents, shop owners, pedestrians, transit system operators, local administrators, etc. Thus, when seeking to determine whether the outcome of a city logistics policy is likely to be positive, negative or indifferent it is necessary to evaluate all the different points of view belonging to the different stakeholder groups.

The multi-actor procedure for evaluating city logistics policies was first introduced by Taniguchi and Tamagawa (2005), limiting the scope to five main stakeholder groups: carriers, shippers, residents, administrators and urban

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expressway operators. This multi-actor approach was further developed with the formulation of the multi-actor multi-criteria analysis (MAMCA) methodology (Macharis, 2009). This procedure is based on an evaluation matrix where a multi-criteria analysis is formulated independently for each stakeholder group, thus accounting for the fact that different groups will usually have a different view on the evaluated initiatives. The evaluation objectives, and also the weight for the different objectives and evaluation criteria, are therefore different for each stakeholder group.

This multi-actor approach is widespread today as the most appropriate procedure to evaluate city logistics policies. However, little is written about the homogeneity or heterogeneity of those stakeholder groups. When logistics operators assign a 0.55 priority to public transport initiatives in a Flemish strategic experiment (Macharis et al, 2010) or carriers show a 25% support to the increase of load/unload bays in Rome (Stathopoulos et al, 2012), what does it mean? What information can be hidden behind those figures? Should stakeholder groups be further broken down into homogeneous categories, in order to better represent their evaluation process?

We did not have these questions in mind when we undertook the work that is presented here. Our objective was to determine whether certain urban freight initiatives could contribute to alleviate the daily delivery process at a fresh food market in the city of Seville, in Spain. However, the evaluation questionnaire that we passed on to the retailers working in the market led us to further investigations on the reasons behind the results obtained, and this in turn provided some interesting insights on the clear segmentation shown in some cases within these stakeholder groups. The following sections present the case study that we are referring to, the proposed solutions and the survey results, followed by the in-depth analysis of the existing scenario and the conclusions that we were able to draw from it.

2. Description of the case study

We conducted our case study at the Feria Fresh Food Market (see Figure 1), located within the historical center of the city of Seville, a 700,000 population town in the South of Spain. A traditional type of premises in Spain, these markets consist of large buildings containing multiple stalls belonging to independent retailers who sell mostly fresh food, including fish, meat, fruit and vegetables. This grouping of retailers in one single building, usually located in traditional areas of the city, raises multiple freight delivery issues, normally concerned with accessibility and parking.

As Figure 2 shows, the Feria Market is accessible by road only from one side, which is where the curbside load zones serving the premises are located, while the other three sides correspond to pedestrian areas. There exist a total three load zones to serve the market, including one right in front of it with capacity for five vehicles plus two additional zones in the nearby area for seven and three vehicles respectively. Part of the market's load zone is reserved during the afternoon hours for the local waste collection company.

The market consists mainly of fresh meat, fish and fruit and vegetables stalls, but it also contains a large variety of other types of shops selling products like fresh pasta, canned food, drinks, ice-cream or sushi. Table 1 shows the distribution of commercial activities in the market. In the case of the Feria Market, the efficiency and reliability of deliveries, as well as the availability of parking space is a concern for both carriers and receivers. The narrow streets in the area, the access time windows and the delivery frequencies imposed by supply chain considerations are the main transport-related worries for these stakeholder groups.

Table 1. Distribution of commercial stalls in the Feria Market.

Type of commerce	No of stalls
Meat	5
Pork products	2
Fruit and vegetables	10
Fish	8
Chicken	3
Others	17

Fig. 1. View of the Feria Fresh Food Market in Seville.

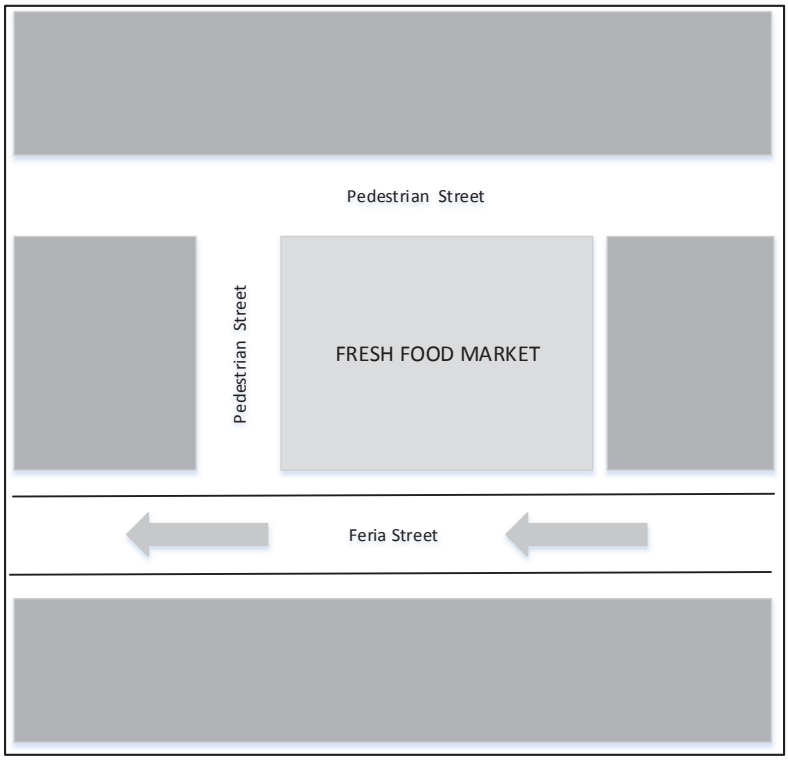

Fig. 2. Distribution of areas in the zone.

3. Proposed solutions

Whatever the solution to implement in the Feria Market, it needs to be supported by a vast majority of the market retailers. We proposed two options to them, including the establishment of a cooperation scheme, which was our primary objective, and also the introduction of parking meters, which was suggested by some of the shop owners during preliminary talks. We decided to test both measures in parallel, thereafter comparing the results obtained.

3.1. Delivery cooperation scheme

Urban cooperative deliveries (Figure 3) constitute a truck demand management strategy that can significantly reduce congestion and emissions by consolidating deliveries of goods at a facility outside urban areas (Chen et al, 2012). There exist several examples of different degrees of implementation of this policy, including the Bangkok analysis (Qureshi and Hanaoka, 2006), the Japanese efforts (Hayashi et al, 2006), the German experiment in Kassel (Köhler, 2004) or Project CARAVEL in Genoa, Italy (Civitas, 2009). Whether through the use of simulation or via actual pilot implementations, these cities tested the implementation of a cooperation scheme for goods delivery. This scheme included the introduction of shared vehicles for freight distribution, together with the establishment of agreements between the stakeholders involved, like commercial associations and logistics operators. The implementation of this policy resulted in significant alterations of the delivery practices, together with a reduction in the overall route mileage.

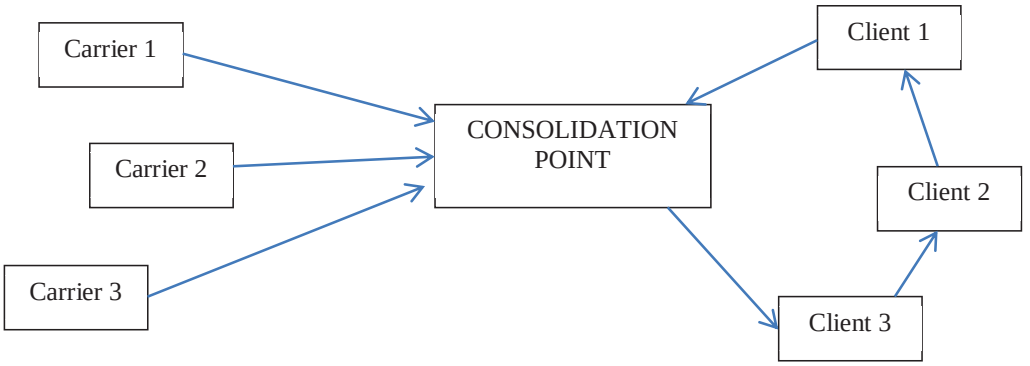

Fig. 3. Schematic representation of a cooperative delivery scheme.

The suggestion offered to the retailers in the Market including the possibility of establishing a consolidation point in the outskirts of the city center, around 1.5 miles away from the premises (see Figure 4). Rather than a goods consolidation point in strict sense, this location would allow the cooperating retailers to park their individual vehicles to enter the city center with a single van.

Fig. 4. Location of the Feria Market (A) and the proposed consolidation point (B).

3.2. Introduction of parking meters

This policy would improve the accessibility of customers to the market, as shown in similar experiences developed in the Spanish cities of Mérida and Toledo. It also enables those shop owners who favor own-account goods transport to park their private vehicles during short periods of time.

Nevertheless, while the perception of this policy was positive in the case of Toledo, the shop owners in Mérida were clearly against it, believing that it discouraged sales rather than promoting them, since the cost to be assumed by the final customers was now increased by the parking fee amount. Also, they emphasized that it does not represent a solution for own-account carriers, since the cost of parking a vehicle during the whole business day is clearly excessive.

4. Survey results

All the market's retailers took part in the survey during the first months of 2014. The results show that a significant number of the market retailers transport their own goods, which means that they are directly affected by the scarcity of parking space. Besides, almost all the delivery activities take place on a daily basis, increasing the parking problems especially during the 7.00 – 9.00 period. Most of the retailers collect their goods at the Seville official fresh product wholesaler (Mercasevilla), typically using either large or small vans.

The opinions with respect to the difficulty of parking in the reserved spaces are unanimous, which proves it as an objective fact. The option is then either to double-park, which is not always feasible in a one-lane street with bus traffic, or to find a parking space away from the market, with the subsequent difficulties for the final delivery. All this

results in large inefficiencies, increasing difficulty and parking tickets. A particular source of discontent is the lack of rotation in load zones, which is often the case in Spanish cities (Muñuzuri et al, 2012).

With respect to the proposed initiatives, the results obtained can be summarized as follows:

- There is a generalized lack of support for the cooperation scheme, mainly due to the retailers' desire for independence in terms of schedules, frequency, etc., and also to their different requirements, like packaging management in the case of fruit and vegetables. The main support for this policy came from the fish retailers, some of which are in fact operating the only existing cooperation case in the Market. They did mention to us that cooperative deliveries were commonplace years ago among fish retailers, but they disappeared when it became easier for them to own and manage their own vehicle. On the other hand, fruit and vegetable retailers fill their own vehicles with high load factors, so the possibility of establishing cooperative schemes is not attractive at all for them. Finally, those retailers selling other types of products (pasta, shoes, liquors, electric apparels, etc.) in the Market, amounting to 38% of the total number of retailers, would not be affected by this policy, since each one of them buys goods at different origins.
- On the other hand, with respect to the possibility of incorporating parking meters in operation after 11.00 in the load zones has a better support, even with one third of the surveyed retailers clearly against it. Those in favor consider that this policy might improve the affluence of customers to the market, while those against it stress that it would only represent additional costs. These latest retailers suggest the opening of new loading/unloading areas in the surrounding pedestrian streets, but this is clearly against the pedestrianisation policy followed by the local Administration over the last decades.

The following Figures 5 to 11 summarize the results obtained from the survey.

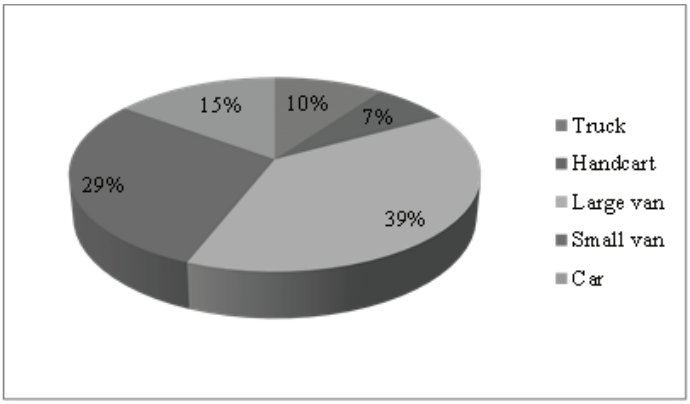

Fig. 5. Types of vehicles used by carriers serving the Feria Market

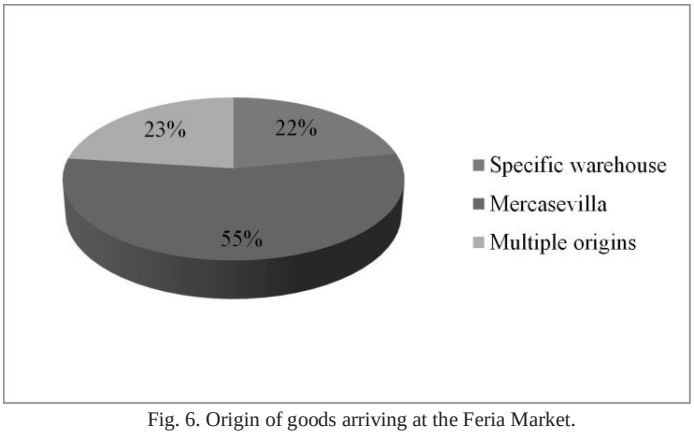

Fig. 6. Origin of goods arriving at the Feria Market.

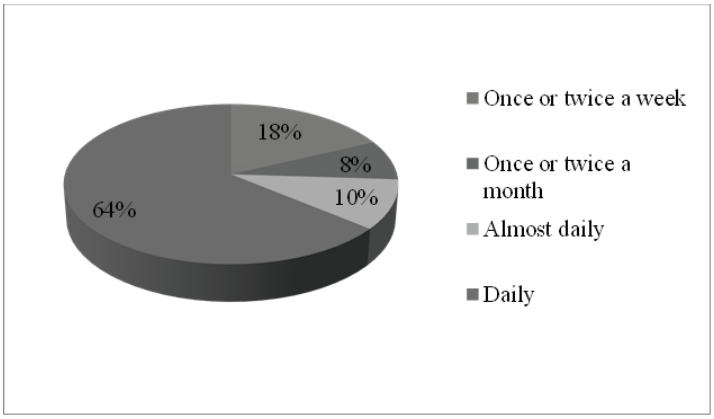

Fig. 7. Delivery frequencies at the Feria Market

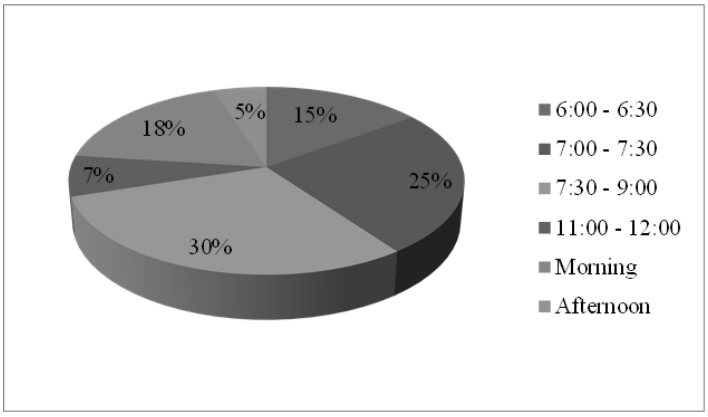

Fig. 8. Arrival times for deliveries at the Feria Market

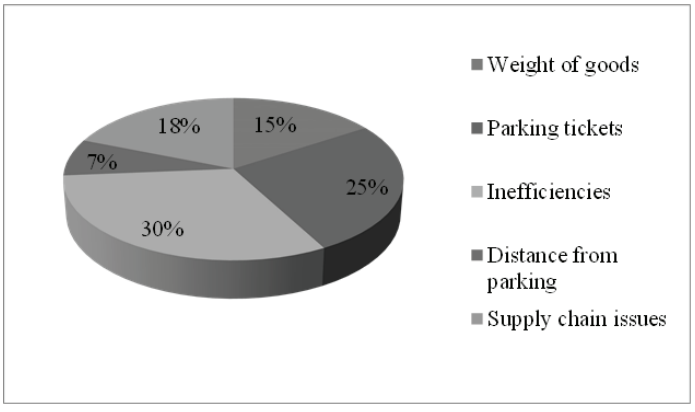

Fig. 9. Main problems perceived by carriers operating at the Feria Market

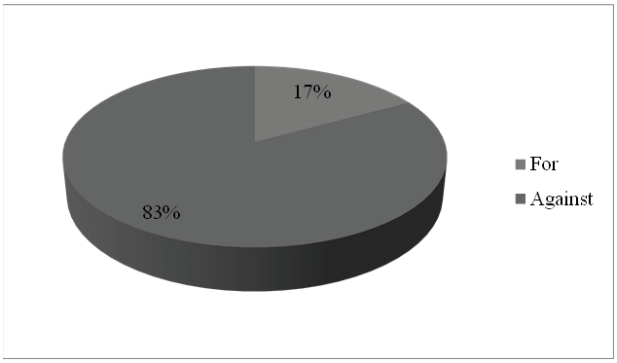

Fig. 10. Perception of the proposed cooperation scheme.

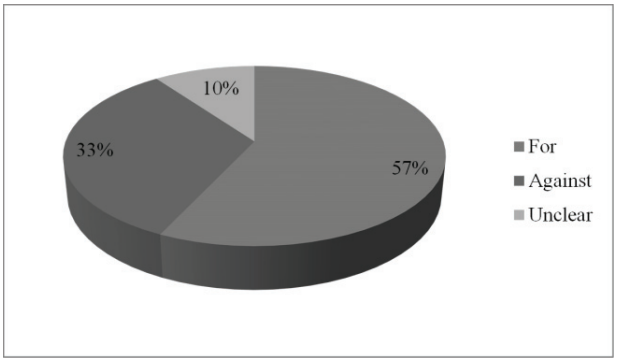

Fig. 11. Perception of the proposed parking meter scheme.

4. Evaluation

We applied a multi-actor multi-criteria evaluation methodology (Larrañeta et al, 2000; Macharis, 2009) to the input data obtained from the surveys. Our methodology is based on a Likert-type scale where +3 is the most positive value and -3 the most negative one. The procedure includes additional estimations of the difficulty associated to the implementation of the measure and to the existence of direct costs linked to that implementation to be covered by each stakeholder group.

Then, each measure is evaluated for each stakeholder group according to a series of pre-established objectives. Each objective is assigned a normalized weight, depending on its relevance as perceived by the stakeholder group, and the final score for each solution results from the weighted average of the points assigned to each objective. The methodology results in a final score for each proposed measure and for each stakeholder group.

We considered two stakeholder groups in the analysis, corresponding to the retailers in the market who transport goods on their own account (we will call them “carriers”), and those who receive the goods transported by a third party (we will call them “receivers”). There would be several other stakeholder groups to incorporate into the analysis, like the residents, the local administration, etc., but our focus was put simply on the retailers operating in the Market. The set of objectives assigned to each stakeholder group was as follows:

- Carriers: Parking time reduction, reduction of other costs, simplicity of the process
- Receivers: Competitive advantage, customer accessibility

Table 2 shows the weights assigned to each objective, the points corresponding to the effect of each measure on each objective, and the final score for each measure according to each stakeholder group.

Table 2. Stakeholder evaluation of the proposed solutions.

			CO-OPERATION		PARKING METERS		**Solution score**	
	DIFFICULTY		1		1			
		Weight	Normalised weight	Points	Normalised weight	Points	COOPERATION	PARKING METERS
CARRIERS	Direct Costs		NO		NO			
	Parking time reduction	10	0.4		0.4			
				-2		1		
	Reduction of other costs	10	0.4		0.4			
				1		-1		
	Simplicity of the process	5	0.2		0.2		**-0.80**	**0.00**
				-2		0		
RECEIVERS	Direct Costs		NO		NO			
	Competitive advantage	4	0.29		0.29			
				0		1		
	Customer accessibility	10	0.71		0.71		**0.71**	**2.42**
				1		3		

For the carrier stakeholder group, the quantitative evaluation provided a negative score for the cooperation scheme, while the parking meter option obtained a zero value. Receivers gave a positive score to both options, much larger in the case of parking meters, due to the additional customer accessibility provided by such a scheme.

These values obtained in the analysis are obviously dependent on the actual values of the parameters used in the calculations. However, even if these values may be argued upon or subject to sensitivity analysis, at least the general tendencies, indicating the general acceptance or rejection of the proposed policies, can be accepted in this type of procedure. Also, scores with high absolute values, whether positive or negative, can be assumed to show these tendencies of acceptance or rejection more clearly.

5. A deeper insight on the current scenario

We felt that those quantitative results, despite corresponding to the general opinions expressed by the retailers, did not fully describe the existing scenario in the Feria market. We thus decided to take a closer look in order to define the reasons for the retailers' opinions:

- We carried out a quick survey among the Market customers, and it showed clearly that none of them used the car to come shopping. Some of them used it to go to specific supermarkets or hypermarkets in the outskirts of the city, but the Feria Market (as most fresh food markets in Spain do) operates as a proximity market for the neighboring area. None of the surveyed customers expressed any need for a parking meter scheme.
- The number of load zones available is sufficient to serve the Feria Market, as long as the specified rotation is maintained. The existing regulations specify a maximum 15 minute period for unloading operations, after which the delivery vehicle has to leave its place to another one.
- The analysis of the retailers' surveys showed that only those selling fruit and vegetables were against the parking meter scheme, while all the rest supported it.

We then carried out a second round of surveys with some of the Market's retailers, this time applying the in-depth interview technique. As usual, they were willing to speak about their everyday problems, rather that filling out a questionnaire, and we obtained much more valuable information this second time:

- The origin: the rotation problem in load zones is caused by fruit and vegetable retailers. They are the ones who arrive earliest in the morning, and park their vehicles in the Market's load zones. But, instead of simply unloading the day's goods and moving their vehicle away, they keep them parked in the same place for days. They only need to restock once or twice a week, and the rest of the time the vehicle is used as an on-street warehouse where fruit and vegetables are kept until needed in the actual market stall.
- The feeling: this does not happen only because fruit and vegetable retailers are inconsiderate with the rest. Probably, according to the situation in other similar areas of the city, if these retailers respected the 15 minute rotation regulation, any other Market retailer finding a free space in front of the building would probably leave his vehicle there, if not for several days, at least for the rest of the day's business hours.
- The bad solution: while the control of load zone rotation, a responsibility of the local police, is somewhat relaxed in the city, the control of metered parking, outsourced to a privately managed service, is more efficient. If parking meters are installed in front of the Market, fruit and vegetable retailers would not be able to leave their vans parked for days, having to free the spaces by 11.00. This, in view of the rest of retailers working in the Market, would put them in the same position as everybody else.
- The good solution: the real solution to the load zone rotation problem should simply consider the enforcement of the existing regulations. However, the local police have no technical means to determine whether the vans parked in front of the Market have been there for five minutes or three days. The option of remaining in front of the building and ticket every van that does not move away after 15 minutes is currently not contemplated, but it seems like the only option to guarantee the enforcement of the rotation rule.

Why did then our multi-actor multi-criteria analysis show a neutral perception of the parking meter option? The reason lies in a defective segmentation of the stakeholder groups. We carried out the analysis again, this time considering three different stakeholder groups, instead of two, as follows:

- Fruit and vegetable retailers who transport goods on their own account ("Fruit carriers")
- Other retailers who transport goods on their own account ("Other carriers")
- Retailers who receive goods transported by a third party ("Receivers")

The result of the analysis with three stakeholder groups is shown in Table 3. This time, the quantitative results seem to provide a much better description of the existing scenario:

- Both types of carriers are opposed to the cooperation scheme, but fruit carriers show a stronger opposition, since they have a rather easy life with the current state of affairs.
- Non-fruit carriers are clearly in favor of parking meters, since they will force fruit carriers to move away, and this should free some of the available curb space to be used by the rest.
- In parallel, fruit carriers are strongly opposed to parking meters.
- Receivers have a positive perception of both measures: the cooperation scheme is likely to result in more parking spaces available for their transport operators, but specially parking meters should provide better accessibility for their customers (although this is not very clear, given the current behavior of their customers, but they are confident in at least starting to be an option for non-resident customers), providing them a competitive advantage over similar locations in the city center.

Table 3. Modified stakeholder evaluation of the proposed solutions.

			CO-OPERATION		PARKING METERS		**Solution score**	
	DIFFICULTY		1		1		COOPERATION	PARKING METERS
		Weight	Normalised weight	Points	Normalised weight	Points		
FRUIT CARRIERS	Direct Costs		NO		NO			
	Parking time reduction	10	0.4		0.4			
				-2		-2		
	Reduction of other costs	10	0.4		0.4			
				1		-2		
	Simplicity of the process	5	0.2		0.2		**-0.80**	**-1.80**
				-2		-1		
OTHER CARRIERS	Direct Costs		NO		NO			
	Parking time reduction	10	0.4		0.4			
				-1		2		
	Reduction of other costs	10	0.4		0.4			
				1		0		
	Simplicity of the process	5	0.2		0.2		**-0.40**	**0.80**
				-2		0		
RECEIVERS	Direct Costs		NO		NO			
	Competitive advantage	4	0.29		0.29			
				0		1		
	Customer accessibility	10	0.71		0.71		**0.71**	**2.42**
				1		3		

6. Conclusions

Due to the different interests and perceptions, the evaluation of city logistics policies usually requires a multi-actor multi-criteria approach. This takes into account the different views of the different stakeholder groups, and the fact that each one of these groups makes decisions according to an entirely different set of partial objectives, each objective weighing differently in the overall perceived utility. The analyses available in the literature are clear with respect to the distribution of stakeholder groups: carriers, residents, receivers, public administration, etc.

Seeking to assess the expected effect of two alternative policies (cooperative deliveries and the installation of parking meters) on the retailers working in a fresh food market in the Seville city center, we thus decided to apply this methodology. However, we found that the typical distribution of stakeholders (own-account carriers and receivers, in our case) did not provide entirely representative results.

Following a deeper analysis of the responses given to our survey, we concluded that a further segmentation of the carrier group was necessary, given the existence of two clearly defined postures within that group. We divided that group into those own-account carriers related to the fruit and vegetables sector, and those related to other sectors, and now the quantitative analysis features three homogeneous groups, which corresponds much better to the actual existing scenario.

The individuality of the retailers involved is then the main reason behind their rejection of cooperative schemes, which would possibly result cheaper, more sustainable and free from the intervention of the administration. In its place, the only way out for the local authorities in view of the existing conflict in the Market was the installation of parking meters in the load zones (which incidentally had been voted by the retailers in an assembly with a rather low level of participation and consensus).

The main recommendation extracted from this experience leads to the need to have a closer look at stakeholder groups in this type of multi-actor multi-criteria methodologies. Considering generic stakeholder groups may provide undetailed pictures and impede the extraction of accurate conclusions from the quantitative data. On the other hand, the segmentation of one or more stakeholder groups into smaller units provides a much better picture of the existing situation, and therefore turns this quantification into a much better decision-aid tool.

Acknowledgements

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