

Regional logistics land allocation policies : stimulating spatial concentration of logistics firms

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**Regional logistics land allocation policies:
Stimulating spatial concentration of logistics firms**

Frank P. van den Heuvel, Peter W. de Langen,
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Regional logistics land allocation policies: Stimulating spatial concentration of logistics firms

Frank P. van den Heuvel, Peter W. de Langen, Karel H. van Donselaar, Jan C. Fransoo

*School of Industrial Engineering, Eindhoven University of Technology
P.O. Box 513, 5600 MB, Eindhoven, The Netherlands*

Although spatial concentration of logistics firms in logistics concentration areas can be beneficial for society at large, there is not much research on the relationship between land allocation policies and logistics concentration areas. This paper analyzes land allocation policies by means of a survey conducted in the south of the Netherlands. Results show that municipalities do not actively stimulate spatial concentration of logistics firms, although both aldermen and public administration employees acknowledge that co-location of logistics firms can lead to benefits. There is a need for cooperation between municipalities, such that a regional policy can be developed, to attain the regional benefits of logistics concentration areas, while local disadvantages (like congestion and CO₂ emissions) can be reduced. Respondents acknowledge the positive effects of cooperation with respect to logistics land allocation and only recognize some impediments. Municipalities that already cooperate with others are positive about the results. However, as municipalities are reluctant to lose control over the land, a step-by-step approach to cooperation is suggested.

Keywords: Land allocation, Logistics, Spatial concentration, Agglomeration economies

1 Introduction

Anecdotal evidence shows that logistics parks, in for example Zaragoza, and port areas, like in Singapore and Rotterdam, are highly attractive for logistics activities (of logistics service providers as well as shippers). Previous research has shown that co-location of logistics firms in these logistics parks is not only beneficial for these firms, but also for society at large (Van den Heuvel et al., 2012). Co-located logistics firms share more transport capacity than non-co-located firms do (Sheffi, 2012). This means more bundling of transport flows, which directly results in fewer trucks on the road, positively influencing congestion and CO₂ emissions.

Porter (2000) and many others argue that governments have the role to facilitate the development and upgrading of clusters. In most countries, spatial plans and land use choices are made by local and/or regional governments. Hence, these governments influence the location of (logistics) firms. Hensher and Brewer (2001) legitimately remark that the development of a regional freight strategy is the responsibility of both the private and the governmental sector. Site selection and land allocation are important components of an effective strategy that can decrease traffic congestion and freight costs, and increases robustness. While the effect of transportation infrastructure decisions on land use change is commonly researched (e.g., Halden, 2002; Geurs and Ritsema van Eck, 2003; Funderburg et al., 2010), research on land allocation and logistics concentration is very limited. Based on the societal effects of logistics concentration areas, one would expect policy makers to encourage co-location of logistics firms with their land allocation policies.

In this paper, we investigate the land allocation to logistics firms in municipalities in the south of the Netherlands. In the Netherlands, municipalities are responsible for land use decisions and

development of economic zones. We analyze whether municipal policy makers acknowledge synergies through co-location of logistics firms and take these into account in their land allocation decisions. The region consists of 113 municipalities that together own 22,570 hectares of industrial land. There is insufficient demand to develop logistics concentration areas in all municipalities. Hence, collaboration between the municipalities is inevitable to develop a regional logistics land allocation policy. We investigate the opportunities for and impediments to collaboration between municipalities with regard to logistics land allocation.

The remainder of the paper is organized as follows. Section 2 describes the relevant literature. Section 3 presents the survey design. Section 4 describes the results and Section 5 concludes the paper.

2 Spatial concentration of logistics firms and logistics land allocation

Although land allocation decisions deeply influence location patterns of logistics companies, and thereby the efficiency of freight transport, according to our knowledge, these decisions have hardly been studied. Co-location synergies have not been identified as a relevant issue in land allocation decisions and have never been empirically analyzed.

There is widespread acceptance that integrating decisions in land use planning, transport, and environment policy is crucial for sustainable development (Geerlings and Stead, 2003). For passenger transport, it is generally recognized that the location of employment near public transport nodes can significantly increase the use of public transport. Location policies are aimed at matching the accessibility profiles of business sites and the mobility profiles of firms (Van Wee and Van der Hoorn, 1996). This reasoning can be extended to freight transport. The probability that a firm will use multimodal transport decreases with the distance to the nearest intermodal terminal. An active land allocation policy related to land for logistics can increase the use of multimodal transport. According to McKinnon (2009), demand for logistics-related land is likely to be increasingly linked to rail networks and (inland) ports.

Logistics concentration areas at strategic locations can reduce freight transport (Wagner, 2010) as spatial concentration of logistics firms relatively often share transport capacity (Sheffi, 2012, Van den Heuvel et al., 2012), which influences the efficiency of freight transport and the amount of transport flows in the region. In addition, Sheffi (2012) emphasizes the effects of logistics clusters on the local logistics labor market and on knowledge exchange.

As not all municipalities can have successful logistics concentration areas (in the south of the Netherlands there are 113 municipalities and thirty concentration areas, based on the definition of Van den Heuvel et al, in press), there is a need for cooperation between municipalities. Geerlings and Stead (2003, p. 188) define this as "inter-territorial integration: policy integration between neighboring authorities or authorities with some shared interest in infrastructure and/or resources". Such cooperation aimed at jointly organizing the acquisition of logistics firms and the allocation of land for logistics can result in benefits, like cost reduction for municipalities and a better use of scarce infrastructure. However, benefits of cooperation are uncertain. Similar to the private sector, trust building is a crucial element for the success of collaborative governance (Ansell and Gash, 2008; Emerson et al., 2012), which is related to the difficulty to find a fair distribution of expected and unexpected costs and benefits (as Cruijssen et al. (2007) showed for logistics firms). For collaboration between public agencies, especially the political costs, related to giving away control over one's own activities, are especially relevant (Weiss, 1987).

Figure 1 presents three different forms of cooperation between municipalities:

1. Cooperating municipalities collectively establish an organization responsible for the marketing and sales of land for logistics: the Logistics Acquisition Organization (LAO). Representatives of participating municipalities form the board of the LAO. While the municipalities remain owner of the land, the LAO gets a mandate in advance to negotiate with interested logistics firms based on the valuation of the land. The primary task of the LAO is to acquire logistics firms for the available land. Municipalities have to direct interested companies to the LAO. Land allocation for non-logistics firms (defined in detail in advance) remains outside the scope of the LAO.
2. Cooperating municipalities jointly outsource acquisition of logistics companies to an External Acquisition Company (EAC). The EAC has a similar function as the LAO above. Municipalities directly receive the revenue from issued land and the EAC gets a variable and/or fixed fee.
3. Cooperating municipalities jointly sell all land for logistics firms to a Corporatized Logistics Park Developer (CLPD). Municipalities have shares in the CLPD based on the land valuation and receive dividends. Interested firms choose from all options the CLPD offers. Municipalities cannot influence the land price offered by the CLPD. A supervisory board controls the CLPD.

Land ownership	Private	3. CLPD: Corporatized Logistics Park Developer
	Public	1. LAO: Logistics Acquisition Organization
		2. EAC: External Acquisition Company
		Public Private
Marketing and sales of land for logistics		

Figure 1: Classification of the forms of cooperation between municipalities

The three different forms of cooperation primarily differ in the level of outsourcing of activities. Outsourcing involves a shift towards greater managerial autonomy, and is often associated with increasing quality (Farneti and Young, 2008). However, outsourcing is also associated with reduced public control. The outsourcing relationship is especially beneficial if all participants (public and private) actively participate to increase the efficiency of the processes and the service to the customer, opposite to the traditional view of outsourcing, in which involved parties merely serve as buyers and sellers (Amirkhayan, 2008). Municipalities and other public agencies increasingly collectively organize outsourcing (Hulst and Van Montfort, 2007). Furthermore, more complex forms of coordination in the procurement process emerge (Bovaird, 2006).

In the first form of cooperation presented in Figure 1, municipalities do *not* outsource land allocation to logistics firms; The LAO collectively organizes this in-house. Although municipalities agree to cooperate, and hence, lose control over their own land, this form secures direct public control. In the second form, the marketing and sales of land to logistics companies is outsourced to an EAC. Specialists are hired, who specifically focus on the acquisition of logistics firms (while acquisition is just one of the tasks of municipal employees in the LAO). In the third form of cooperation, the

complete process of land allocation to logistics firms is outsourced (potentially to a publicly owned company). The CLPD becomes owner of the land and is responsible for the acquisition of logistics firms for this land. As municipalities do not have any influence on the price of the land, there is no competition anymore. Note that the empty quadrant in Figure 1 contains a form of cooperation that is not feasible in practice, as municipalities that no longer own the land cannot still perform marketing and sales activities for that land.

3 Research methodology and data collection

This paper studies spatial concentration of logistics firms in relation to land allocation policy through a survey that tests the level of agreement of regional policy makers with the propositions presented in Table 1. These propositions can be divided in five different categories. Seven propositions deal with the current way of land allocation. The next fifteen propositions address whether policy makers are aware of and acknowledge the effects (including negative ones) from co-location of logistics firms. Afterwards, the survey addresses benefits from and impediments to cooperation with respect to logistics land allocation. Finally, three propositions deal with the organization of cooperation between municipalities.

Table 1: Propositions

Code	Statement
Current situation	
CUR1	Our municipality has a clear vision regarding the desired allocation of the available land on business parks.
CUR2	Our municipality provides land to any type of firm as long as sufficient land is available and the activities match with the general limitations (e.g. nuisance categories).
CUR3	Our municipality is committed to attract companies from certain sectors. Our municipality actively looks for firms that match the current activities on our industrial area(s).
CUR4	Our municipality does not perform active acquisition: we inform target firms that we have land available and then wait for further interest of firms.
CUR5	When land is available on one of our business parks, we deliberately look for a company from a certain (appropriate) industry.
CUR6	Our municipality is facing competition from other municipalities in the South of the Netherlands in terms of attracting firms.
CUR7	Land specifically available for logistics activity is only issued to logistics firms.
CUR8	With acquiring logistics companies we deliberately look for a company that wants to make use of intermodal terminals in the area.
Spatial concentration of logistics firms	
	Spatial concentration of logistics firms leads to ...
CON1	... more cooperation between these firms.
CON2	... more knowledge sharing between these firms.
CON3	... cost efficiencies for these firms.
CON4	... more bundling of transport flows.
CON5	... more exchange of storage capacity between these firms.
CON6	... less trucks on the roads in the South of the Netherlands.
CON7	... more trucks on the roads in and around the municipalities with the logistics parks.
CON8	... more use of multimodal transport (via water and/or rail).

Table 1: Propositions (continued)

Code	Statement
CON9	... a higher attractiveness of the South of the Netherlands for logistics firms.
CON10	... a higher attractiveness of the municipalities with industrial areas specialized in logistics for logistics firms.
CON11	... a higher attractiveness to work in the logistics sector in the South of the Netherlands.
CON12	... a higher attractiveness to work in the logistics sector in the municipalities with industrial areas specialized in logistics.
CON13	... more cooperation between logistics education institutions and the logistics sector.
CON14	... more cooperation between universities and the logistics sector.
CON15	... a higher land price for land on logistics parks.
Benefits from cooperation with respect to logistics land allocation	
	Cooperation with respect to logistics land allocation leads to ...
ADV1	... better spatial planning of logistics companies.
ADV2	... lower operating costs related to land allocation.
ADV3	... lower costs related to acquisition of logistics firms.
ADV4	... a higher land price for land on logistics parks.
ADV5	... more active acquisition of matching firms.
ADV6	... better service to interested firms.
ADV7	... more demand for land for logistics firms.
ADV8	... more spatial concentration of logistics firms.
ADV9	... fewer demands on the (scarce) capacity of the road infrastructure in the South of the Netherlands.
ADV10	... a sustainability advantage, as the amount of road transport in the South of the Netherlands decreases.
ADV11	... a higher productivity of the logistics firms in the South of the Netherlands.
ADV12	... better use of the (scarce) intermodal infrastructure.
ADV13	... an increased competitiveness of the South of the Netherlands as a location for logistics firms.
Impediments to cooperation with respect to logistics land allocation	
IMP1	It is very hard to determine the benefits of cooperation beforehand.
IMP2	A fair allocation of the benefits of a cooperation cannot be ensured.
IMP3	A fair allocation of the workload related to a cooperation cannot be ensured.
IMP4	It is very hard to find an effective form of cooperation.
IMP5	It is very hard to find reliable partners to cooperate with.
IMP6	It is very hard to convince municipalities that all relevant information has to be shared.
IMP7	With jointly organized logistics land allocation municipalities loose the control of their industrial areas.
IMP8	Cooperation with respect to logistics land allocation with other municipalities is severely hampered by high transaction costs.
IMP9	Cooperation with respect to logistics land allocation with other municipalities is severely hampered by large differences of valuation of land in industrial areas in the South of the Netherlands.
IMP10	Most municipalities in the South of the Netherlands mainly focus on developments within their own municipal boundaries.

Table 1: Propositions (continued)

Code	Statement
IMP11	It is difficult or impossible to change the existing fragmented spatial structure of logistics firms.
Success of cooperation with respect to logistics land allocation	
	Cooperation with respect to logistics land allocation only succeeds if ...
SUC1	... a fair allocation of the benefits can be made in advance.
SUC2	... a fair allocation of the workload can be made in advance.
SUC3	... municipalities are willing to agree to not contact firms without making use of the cooperation.

An online questionnaire with the propositions presented in Table 1 was sent to all municipalities in the south of the Netherlands. This region consists of three provinces: Noord-Brabant, Limburg, and Zeeland (see Figure 2). Due to the location of these provinces in between large ports (in Rotterdam and Antwerp) and major consumer markets in northwestern Europe, the logistics sector is very important for this region. Respondents were mostly asked to indicate the degree of agreement per proposition based on a 7-point Likert scale: (1) strongly disagree, (4) neutral, and (7) strongly agree. One-way one-sample t-tests are used to test whether the observed average levels of agreement are significantly higher than four. To conclude that outcomes are significant, a significance level α of 0.05 is used. In addition, respondents were asked to indicate the most and least appropriate form of cooperation from the forms presented in Figure 1.

In all 113 municipalities, the responsible alderman and the public administration employee responsible for spatial planning received an email with the request to fill out the online questionnaire. The aldermen, together with the mayor, form the executive board of a municipality. Public administration employees are not elected and form the staff of a municipality. Politicians (the elected aldermen) and public administration employees (public professionals) may have different opinions regarding appropriate ways of land allocation (to logistics firms).

118 respondents fully filled out the questionnaire, corresponding with a response rate of 52%. These respondents represent 89 (79%) of all 113 municipalities. Four of the respondents indicated that their municipality does not have any industrial area and hence, the questionnaire was not relevant for them. Hence, the analyses are based on 114 respondents.

To check for non-response bias, respondents were divided into two different categories: respondents that only received one email with the request to fill out the questionnaire (41%) and respondents that replied after one or more reminder telephone call(s) and/or one or more reminder email(s) (59%). To test whether the exclusion of non-respondents leads to different conclusions than would have been drawn when everybody would have responded, late respondents are used as a proxy for non-respondents (Armstrong and Overman, 1977). Since there are no significant differences between early and late respondents, non-response bias is not an issue in this study.¹

Table 2 presents descriptive statistics regarding the amount of hectares of industrial areas (areas allocated to industry in zoning schemes; the range of industries includes logistics) in the municipalities in the south of the Netherlands (IBIS, 2012). On average, municipalities have 202 hectares of industrial areas.



Figure 2: The location of the study area in between major consumer markets in northwestern Europe.

Table 2: Descriptive statistics on the industrial areas in the municipalities in the south of the Netherlands

	Hectares of industrial areas	
	All municipalities	Respondents' municipalities
Average	202	230
Median	115	125
Standard deviation	270	307
Minimum	0	0
Maximum	1392	1392

Based on the median amount of hectares of industrial areas (115), a difference was made between respondents from small and large municipalities. Table 3 shows the statistics for these categories of respondents. The first category consists of 52 respondents representing 41 different municipalities. These municipalities are responsible for 9.1% of the 22,571 hectares of industrial areas in the region. The second category consists of 66 respondents from 48 different municipalities. These municipalities are responsible for 75.8% of the hectares of industrial areas. The municipalities from which no response was gathered represent 15.1% of the hectares of industrial areas.

Table 3: Descriptive statistics on the industrial areas in the municipalities of the respondents

	Hectares of industrial areas	
	Small municipalities	Large municipalities
Average	52	371
Median	47	189
Standard deviation	34	352
Minimum	0	118
Maximum	113	1403

Next to the distinctions between politicians and public administration employees a distinction is made between respondents from municipalities with relatively many hectares of industrial areas and municipalities with relatively few hectares of industrial areas. Furthermore, a distinction is made between respondents from one of the seventeen municipalities with an intermodal container terminal

and respondents from municipalities without one. These differences are analyzed with two-sided independent samples t-tests. Results for these differences are presented if significant.

4 Results

A first noteworthy result is that politicians and public administration employees generally have the same opinion. For the limited number of propositions that do show a significant difference, either both groups of respondents agree with the statement or both groups of respondents disagree with the statement. Hence, we conclude that contrary to what one might think, politicians and public sector professionals have very similar views on strategic policy issues.

These views are shown in Table 4 that indicates the average levels of agreement of the respondents with the propositions presented in Table 1, together with the T-statistics that indicate whether the average levels of agreement are significantly higher than four. In addition, the distribution of the response is shown, aggregated to three categories: Disagree (1-3), Neutral (4), and Agree (5-7).

The respondents' municipalities in general have a clear vision regarding the desired allocation of land in industrial areas (CUR1) and are committed to attract firms from specific industries (CUR3). However, when land is available, municipalities do not specifically look for firms from specific industries and all firms can purchase the available land, as long as general regulations that constrain activities are met (CUR2 and CUR5). In addition, municipalities do not specifically look for firms that make use of an intermodal terminal close by (CUR7).

Table 4: Evaluations of the propositions

Code	No. of resp.	Mean	St. dev.	T	Disagree	Neutral	Agree
Current situation							
CUR1	114	5.67	1.25	14.21*	7%	8%	85%
CUR2	113	4.62	1.83	3.59*	27%	19%	55%
CUR3	112	4.30	1.75	1.83*	30%	20%	50%
CUR4	114	4.20	1.89	1.14	39%	18%	43%
CUR5	114	3.14	1.48	-6.20*	60%	24%	17%
CUR6	114	4.18	1.76	1.12	32%	23%	45%
CUR7	114	2.82	1.81	-6.98*	67%	17%	17%
Spatial concentration of logistics firms							
CON1	111	4.87	1.29	7.15*	14%	21%	66%
CON2	113	4.72	1.33	5.72*	14%	27%	59%
CON3	113	4.90	1.25	7.70*	8%	25%	67%
CON4	113	5.25	1.16	11.42*	5%	18%	77%
CON5	113	5.01	1.15	9.30*	9%	19%	73%
CON6	113	4.29	1.47	2.11*	27%	27%	46%
CON7	113	5.29	1.21	11.37*	7%	19%	74%
CON8	111	4.90	1.43	6.62*	14%	22%	65%
CON9	113	5.22	1.22	10.68*	6%	17%	77%
CON10	113	5.19	1.26	10.08*	6%	19%	74%
CON11	113	5.11	1.12	10.49*	6%	23%	71%
CON12	112	5.16	1.07	11.48*	4%	21%	75%
CON13	111	5.13	1.18	10.09*	6%	23%	71%
CON14	113	4.68	1.15	6.29*	12%	35%	54%
CON15	113	3.63	1.23	-3.20*	36%	42%	21%

Table 4: Evaluations of the propositions (continued)

Code	No. of resp.	Mean	St. dev.	T	Disagree	Neutral	Agree
Benefits of cooperation with respect to logistics land allocation							
ADV1	113	5.50	0.91	17.52*	1%	12%	87%
ADV2	112	4.21	1.27	1.71*	22%	42%	36%
ADV3	113	4.59	1.13	5.57*	12%	38%	50%
ADV4	113	3.78	1.16	-2.04*	33%	48%	19%
ADV5	113	5.01	1.11	9.70*	7%	25%	68%
ADV6	113	5.33	1.00	14.06*	3%	14%	83%
ADV7	113	4.67	1.23	5.82*	13%	29%	58%
ADV8	113	5.38	0.92	15.96*	1%	18%	81%
ADV9	113	4.39	1.32	3.14*	23%	32%	45%
ADV10	112	4.08	1.38	0.62	29%	35%	36%
ADV11	113	4.81	1.08	7.95*	4%	39%	57%
ADV12	113	4.97	1.05	9.88*	4%	30%	65%
ADV13	113	5.29	1.14	12.06*	4%	18%	78%
Impediments to cooperation with respect to logistics land allocation							
IMP1	112	4.23	1.41	1.75*	31%	23%	46%
IMP2	112	4.63	1.16	5.69*	13%	33%	54%
IMP3	112	4.46	1.16	4.23*	19%	34%	47%
IMP4	112	4.27	1.34	2.11*	30%	27%	43%
IMP5	112	3.63	1.15	-3.46*	45%	38%	17%
IMP6	112	3.77	1.44	-1.71*	41%	30%	29%
IMP7	112	4.10	1.51	0.69	34%	27%	39%
IMP8	112	3.47	1.09	-5.11*	38%	52%	11%
IMP9	112	4.01	1.25	0.08	32%	38%	30%
IMP10	112	5.00	1.44	7.35*	17%	12%	71%
IMP11	112	3.56	1.23	-3.77*	47%	33%	20%
Success of cooperation with respect to logistics land allocation							
SUC1	108	5.13	1.18	9.91*	8%	18%	74%
SUC2	108	4.96	1.08	9.30*	8%	23%	69%
SUC3	107	4.76	1.50	5.21*	18%	21%	61%

* Significant with $\alpha = 0.05$

Small and large municipalities have different land allocation policies, as shown in Table 5. Large municipalities agree and small municipalities disagree with the propositions that their municipality is committed to attract firms from specific industries (CUR3) and that their municipality is facing competition from other municipalities (CUR6). Furthermore, small municipalities do not perform active acquisition (CUR4), while large municipalities do. Especially the municipalities with many hectares of industrial areas try to fill their land from a viewpoint of spatial concentration, but face relatively much competition from other (large) municipalities. This suggests that cooperation amongst municipalities may be helpful. As small municipalities do not perform active acquisition they experience less competition.

Municipalities with an intermodal container terminal and without one differ rather fundamentally regarding the acquisition of firms that want to use a terminal (CUR7). 21 of the 114 respondents work for a municipality that has an intermodal container terminal. The average level of agreement of respondents from municipalities with an intermodal container terminal (4.67) is significantly higher than the average level of agreement of respondents from municipalities without an intermodal container terminal (2.40; $t = -4.79$, $p \leq 0.000$). Subdividing the respondents from municipalities without a terminal into respondents from municipalities that are adjacent to a municipality with a terminal and

Table 5: Evaluations of differences between small and large municipalities for the propositions on the current situations

Code	No. of resp.		Mean		T
	Small	Large	Small	Large	
CUR1	48	66	5.60	5.71	0.45
CUR2	48	65	4.46	4.74	0.78
CUR3	48	64	3.56	4.86	4.14*
CUR4	48	66	4.67	3.86	-2.28*
CUR5	48	66	2.73	3.44	2.59*
CUR6	48	66	3.65	4.58	2.87*
CUR7	48	66	2.15	3.30	3.65*

* Significant with $\alpha = 0.05$

ones that are not, shows no significant differences (2.14 and 2.63, based on 44 and 49 respondents, respectively). Hence, only municipalities with an intermodal container terminal actively promote the use of multimodal transport. This is surprising, as Kim and Van Wee (2011) report drayage distances (i.e., pre- and post-haulage by trucks) from 25 to 200 kilometers in a study on distances at which the costs of multimodal transport equal the costs of truck-only transport, while the average surface of municipalities in the south of the Netherlands only is 78 km². This means that political boundaries determine land allocation policies that deeply influence the use of intermodal terminals, often partly publicly funded by national governments. This suggests cooperation between municipalities to improve the spatial planning of logistics establishments can increase the use of intermodal container terminals.

Table 4 shows that respondents acknowledge the effects from spatial concentration of logistics firms. For almost all the propositions related to the effects of spatial concentration of logistics firms, the average level of agreement is significantly higher than four. Only for the proposition that spatial concentration leads to higher land prices, the average level of agreement is significantly lower than four. Respondents recognize the disadvantage of having a logistics concentration area in their municipality, being the increase in truck traffic in their municipality (CON7). The second most acknowledged effect of spatial concentration of logistics firms is the increase in transport flow bundling (CON4). Respondents recognize that spatial concentration has a positive effect on the reduction of transport in general (also CON6), but locally it is expected to result in more traffic. This suggests that cooperation is the best way to serve the broader region's economic interest and mitigate local negative effects

Respondents generally agree that cooperation with respect to logistics land allocation can lead to several benefits. The most important benefits are a better spatial structure (ADV1) and more spatial concentration of logistics activities (ADV8). The respondents' average level of agreement is only significantly lower than four for the proposition that cooperation leads to higher land prices (ADV4), which aligns with the disagreement with the proposition that spatial concentration of logistics firms leads to higher land prices (CON15). The average level of agreement for the proposition that it leads to a sustainability advantage, due to less road transport (ADV10) is not significantly higher nor significantly lower than four. Apparently, less truck traffic does not directly lead to a sustainability advantage, according to the respondents.

The major impediment to cooperation between municipalities is the focus of municipalities on their own developments (IMP10), which may be explained by the uncertainty about the distribution of costs of and benefits from cooperation (IMP1-IMP3, SUC1-SUC2). While many respondents agree that cooperation leads to regional benefits (see above), local advantages are hard to determine (in advance). Clarifying this is important for changing the focus from local to regional. Finally, respondents also think it is difficult to find a good form of cooperation (IMP4). Neither the costs of

cooperation itself (IMP8), the existing fragmented spatial structure (IMP11), the difficulty to find reliable partners (IMP5), nor convincing municipalities to share information (IMP6) are issues for cooperation between municipalities. Finally, respondents agree that municipalities should exclusively trade land via the joint organization (SUC3).

In conclusion, the respondents are rather positive about cooperation between municipalities with respect to logistics land allocation. They recognize that cooperation can lead to many benefits and only see a few hurdles, mainly related to the way cooperation is organized.

Figure 3 shows that the first form of cooperation (with the lowest degree of outsourcing) is indicated as most appropriate by half of the respondents. The third form of cooperation (with the highest degree of outsourcing) is indicated least appropriate by 65% of the respondents. The open questions following these forms of cooperation indicate that respondents generally value the first form of cooperation as this form allows municipalities to keep control over their own land. The respondents that prefer the third form of cooperation mostly indicate that although this form of cooperation needs most work beforehand, it is the most promising one in terms of outcomes.

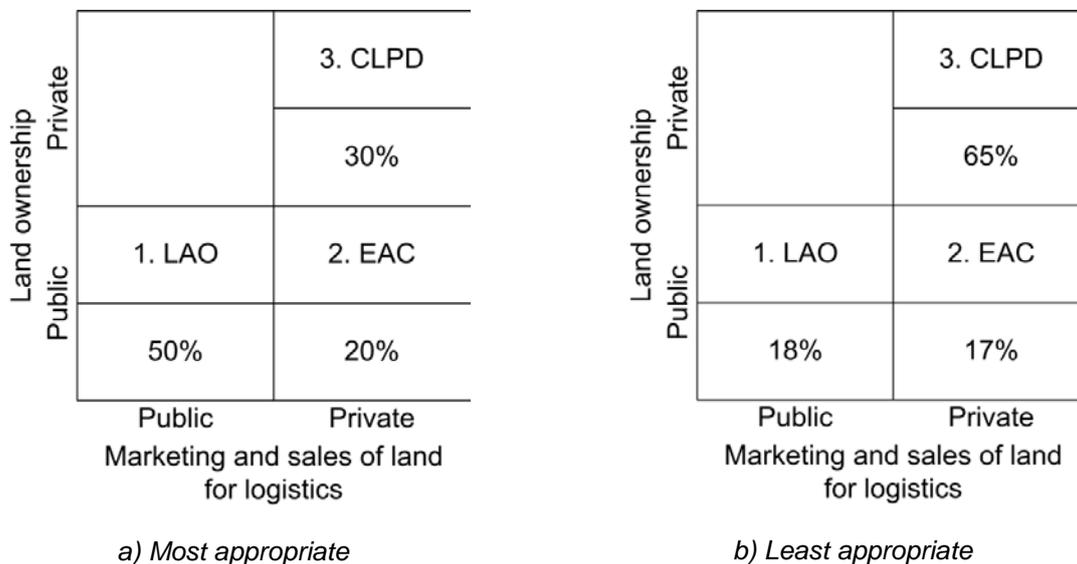


Figure 3: Most and least appropriate forms of cooperation (N=108)

Some respondents indicate that they already cooperate with other municipalities. Five municipalities (of which four participated in the survey) established a regional development organization (Ontwikkelingsmaatschappij Midden-Limburg, 2013). One of the activities of this organization is developing new and restructuring existing industrial areas in the involved municipalities. The cooperating municipalities are shareholders of this organization. Respondents from the respective municipalities are strongly positive about it: they all indicated a form of cooperation with outsourcing (2 or 3) as most appropriate. Four other municipalities have jointly developed a specific industrial park (Kempisch Bedrijvenpark, 2013) where land allocation is done by a project organization, of which the board consists of politicians from the cooperating municipalities. Respondents from these municipalities indicated form 3 as least appropriate. One of them comments that this form of cooperation is a step too far. These examples suggest that experience matters.

In general, most respondents that indicated the third form as least appropriate remark that municipalities are no longer in control with this form of cooperation. This indicates that cooperation between municipalities may be best organized step by step, such that municipalities can experience that outsourcing is beneficial, although municipal control may be decreased.

5 Conclusions

This paper explored land allocation policies of municipalities in the south of the Netherlands. The goals were to investigate whether municipalities have a vision to stimulate spatial concentration of logistics firms, whether municipal employees are aware of the effects of spatial concentration of logistics firms, and whether they are willing to cooperate with other municipalities to more stimulate spatial concentration of logistics firms. Based on a survey conducted with both politicians and public administration employees of the municipalities in the provinces Noord-Brabant, Limburg, and Zeeland, six general conclusions are drawn.

First, no differences between politicians and public administration employees were found. While both types of respondents could have different reasons to be in favor or against cooperation with respect to land allocation to logistics firms, they both agree or disagree on the same propositions.

Second, even though municipalities have a vision regarding the allocation of land and are committed to attract firms from specific industries, they do not actively search for firms from specific industries; On the contrary, all firms that are interested to locate in a municipality can purchase land, as long as this is available and general legal constraints like environmental regulations, are met. This suggests that policies are developed but not fully implemented.

Third, large municipalities, with relatively many hectares of industrial areas, also face significant competition, while small municipalities do not. This indicates that large municipalities compete for the same firms. If land allocation would be aggregated over more than one municipality, competition could be decreased and a vision could be created for the land allocation in multiple municipalities at once, such that spatial concentration is actively stimulated.

Fourth, municipalities acknowledge that co-location of logistics establishments can lead to firm-specific and societal benefits. Municipalities agree that spatial concentration of logistics firms leads to more bundling of transport flows, more cooperation between logistics education institutions and the logistics sector, and a higher attractiveness of the south of the Netherlands as a location for logistics firms. However, spatial concentration of logistics firms is also expected to lead to more trucks on the roads in and around municipalities with logistics parks. Hence, logistics concentration areas are beneficial for the region, but at a local level they can lead to a disadvantage. Again, cooperation seems to be a good way to overcome this disadvantage, as the cooperating municipalities can decide to stimulate the development of logistics concentration areas in a small number of municipalities, such that only in those municipalities additional investments in infrastructure are needed.

Fifth, respondents acknowledge that cooperation with respect to land allocation of logistics firms leads to many advantages and only recognize some impediments to such cooperation. Most important advantages are a better spatial planning and more spatial concentration of logistics firms. In addition, municipalities that already cooperate with others are positive about the results. The major barriers are the current focus on developments within the own municipal boundaries and the difficulty to allocate costs and benefits. Sharle (2002) showed that game theory can be useful in the analysis and practical implementation of public private partnerships and can help to enhance a fair distribution of costs and benefits. Applying game theory to a collaboration of municipalities with respect to land allocation is an interesting topic for further research. This is needed to be able to translate the regional advantages to local advantages.

Sixth, municipalities in general have a preference for a form of cooperation without complete outsourcing of the land allocation process for logistics firms. This is primarily based on pragmatic

reasons, as most municipalities do not want to lose control over their own land. Municipalities that prefer to outsource the land allocation process indicate that this is the most effective way to promote co-location of logistics firms. We therefore suggest a step-by-step approach to organize cooperation between municipalities. To assure that municipalities are willing to cooperate, they should keep control over their land in the early stages of the cooperation. This is best done without outsourcing of activities. If this becomes a success, participants can further increase their efficiency by outsourcing part of the processes. For such a public-private relationship, it is important to explicitly consider the relations between the public policy makers and the private parties, which are key in these kinds of decision making processes (e.g., Hensher et al., 2007).

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Notes

1. Only Proposition CUR3 showed a significant difference between the first and second group of respondents based on two-way independent samples t-tests (with $\alpha = 0.05$). Late respondents agreed more with Proposition CUR3 than early respondents did (3.78 versus 4.68; $t = 2.45$, $p = 0.016$). Section 4 shows that the average agreement of all respondents with this proposition is above four. Hence, assuming that the trend based on early and late respondents can be extrapolated to non-respondents (Armstrong and Overman, 1977), the conclusion would be the same, meaning that non-response bias is no issue.

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