SCHOOL PLANNING AND SUSTAINABLE TRANSPORT, CONCENTRATION OF SCHOOLS ON A SCHOOL ISLAND

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Samenvatting

Scholenplanning en duurzaam vervoer,
Concentratie van scholen op een scholeneiland

In Nederland is er een traditie om concentraties van basisscholen (scholeneilanden) te creëren in nieuwe stadswijken. Het Nederlandse schoolsysteem, met zijn 'vrijheid van onderwijs,' wordt beschreven. Er wordt een kwantitatieve analyse van (de relatie tussen) aantallen nieuwe woningen en aantallen scholeneilanden per gemeente uitgevoerd. Het toont aan dat de traditie wijdverspreid is, maar niet algemeen geaccepteerd. Het primaire motief voor het stichten van scholeneilanden was financiëel, maar de veronderstelde superieure kwaliteit van onderwijs in 'brede scholen' leidt tot meer en grotere scholeneilanden. Dit is verontrustend: het leidt tot een toename van het autogebruik in het woon-schoolverkeer met gevolgen voor de verkeersveiligheid en obesitas. Een afstemming van het ontwerp van lokale verkeersnetwerken en van planning van schoollocaties moet deze effecten kunnen beperken.

Summary

School planning and sustainable transport
School concentration on school islands

In the Netherlands there is a tradition to create concentrations of primary schools (school islands) in new town quarters. The Dutch school system with its 'freedom of education is described. A quantitative analysis of the relation between the number of new dwellings and the number school islands per municipality is presented. It shows that the tradition is widespread, but not generally accepted. The primary motive for creating school islands was financial, but the supposed superior quality of education in 'broad schools' leads to more and bigger islands. This is worrying because it enhances car use in school travel with the inherent consequences for traffic safety and obesity. A coordinated design of local traffic networks and school location planning may mitigate these developments.

Introduction

The Compulsory character of education makes it a government duty to provide safe and sound ways to go to school. The Dutch 'freedom of education' makes the creation of a varied supply of primary schools possible. The habit of concentrating schools in new town quarters gives equal accessibility for these schools, but inevitably decreases the access to primary education as such. Planning schools in new residential areas constitutes special problems, the largest being the demographic instability during the first decades. Concentrating schools on one location may reduce these problems. It is unknown however whether this is a dominant motive. Not even the portion of schools on school islands was known.

We set out to find the quantitative importance of school islands, to discover the motives for creating these and assess accessibility impacts. The sections on 'discovering the unknown archipelago's' and 'a commonwealth of school-islands' summarise the outcomes of our quantitative efforts. A series of possible motives for creating school-islands is presented and compared with those actually used in subsequent sections. Accessibility impacts can be imagined without such difficulty. These are confronted with two large school-islands on strongly different locations in equally differently designed new town quarters.

Compulsory education and the journey to school

Primary education is the first step in a formal process that may take more than 20 years in a person's life. The start and duration of primary education varies from country to country. In The Netherlands a child may go to school at an age of four, but it has to go there when it is five. The primary school has eight forms and thus it will be left for some kind of secondary education upon the age of (nearly) twelve.

Not every child can or has to visit the primary school, partly because of physical inaccessibility, but largely because of pedagogical or behavioural inaccessibility, because it requires a degree of attention which cannot be given in the normal group process.

Pupils with modest mental or behavioural handicaps, like an I.Q. between 55 and 80, are

assigned to the 'special primary school', pupils with other handicaps to special schools of fourteen different kinds.

From four to eight years at least, children cannot be trusted to go to school on their own, because of the dangers of traffic and even more so when they have to bridge a distance requiring some means of transport other than walking. Compulsory education puts the responsibility for transport at least partly on government's shoulders. It should create acceptable conditions for the journey to school. These are moulded in part by location policies.

The freedom of education

A remarkable feature of the Dutch educational system is the so-called 'Freedom of education'. Anyone can constitute a school, to be fully financed by government, on the basis of a sufficient number of signatures by parents willing to send their children to the new school (which of course will have to comply with numerous standards). It is the century old outcome of a long 'school struggle' for education on a religious basis and against a local government school monopoly. More than 90% of primary schools are either Roman-Catholic, Protestant-Christian or 'Public', i.e. under some kind of municipal control. There are numerous other schools though; apart from 'cooperative schools', Orthodox-Protestant ones, Free schools (Anthroposophy based) and a 40 Muslim schools to mention the most important ones.

This freedom more or less implies a second type of freedom: a freedom of choice for the school that is preferred individually. Within each of the sectors, for instance the Protestant one, there are no rigid districts, assigning children to a specific school on the basis of their home addresses. Competition makes this impossible in fact.
Government support for school transportation is restricted though to travel to the nearest school of the preferred religious orientation, including non-religious. A preference for an pedagogical approach, like Dalton, does not count either.

Principles of planning primary schools

School planning is based on population predictions. In The Netherlands these have to comply with a given format. Given the development of housing and population in a certain area it is possible to estimate the number of pupils for at least the next five years. The distribution about different competing schools can be derived from trends, although these are less reliable. There is a variety of reasons for the (change of) school choice: accessibility (or nearness), religious orientation, pedagogical system, educational quality, social climate, ethnic composition of the school population, attractiveness of the school premises…. A change in one or more of these factors may increase or decrease the attractiveness of the school, resulting in unpredicted gains or losses. The imam of a local mosque may prefer non-religious (Godless) education for the children of his followers in the absence of a Muslim school, his successor to the contrary may prefer the religious climate in a Protestant school, that does not demand active participation in worship (as was the case in the author's home town of Zwijndrecht).

The new town quarter constitutes a special problem. There are no inhabitants yet, but schools have to be planned, since children will have to go to school and the journey to an existing school in an old town quarter is likely to be too long and too dangerous.
In this case the pattern visible in the existing built-up area is copied in the new quarter. If for instance Public, Roman-Catholic and Protestant schools are existing, these will return in the new quarter, in spite of a possible minority interest in a different type of school. This minority will have to collect a significant number of signatures to start a school somewhere in the town (295 in the case of Zwijndrecht). Then the national Ministry of Education will have to provide funds for education and the municipality will have to provide lodging for the school.
There is a second problem in new town quarters: the population pyramid tends to be unstable. In the first decade there is a rapid increase in the number of children followed by a

considerable decline as a consequence of aging of the population. After maybe 20 years a stabilisation at a somewhat higher level may take place. The schools in these areas undergo this rise and fall not without trouble. When the fall is sharp it may be lethal, because parents' belief in survival is affected. We found this in case studies of schools, like the Roman-Catholic 'Grote Beer' (Great Bear) in the town of Dordrecht. Constituted in the new 'Stars-quarter' in 1968 it grew to 258 pupils in 1973 to decline smoothly to 124 in 1981 (beneath the official minimum level), 104 in 1982 … and closure in 1985.

> The school building was reconstructed for use as a centre for local Turkish youth. The other two schools of the school-island survived, but both the Protestant and the Public school amalgamated with schools in neighbouring quarters in order to comply with raised standards for minimum school size.

Physical planning aspects

There are three factors of importance for primary school planning. We will discuss these for new town quarters only and assume that these are housing quarters with only local facilities. The factors are:

1. the school ground and buildings,
2. the school location
3. the design of the quarter's street pattern

School planning should be an integrated part of town planning, or perhaps one of the guiding principles. Given the number of residences the possible number of schools can be estimated. Given this number and the shape of the new quarter, a distance optimal distribution of these can be developed.

On the basis of this location pattern the road network can be designed in such a way that schools can be reached easily and safely on foot and by bike and safely only by car. Of course main roads should not be cut through the schools' catchment areas, and pedestrian and cycling crossings should discourage car drivers to speed.

The necessary (or desirable) size of individual schools is of course a central factor in this design process. It is decided partly by minimum standards and partly by the desire for additional facilities or economies of scale.

The minimum size is dictated by the number of pupils and the group size standard, resulting in a number of classrooms, to which (apart from sanitary provisions) a playroom, a staff room and a playground are added.

The concept of 'school-island'

The safety of the school journey is of continuous concern. In The Netherlands there is a growing concern about the accidents caused by increasing car use in school transportation. Especially in new suburban town quarters, with relatively wealthy and busy parents, up to 50% of the children are brought by car. It creates considerable disorder, because parking capacity is restricted and often deliberately so: 'the bank stops the ship', as a Dutch proverb says. In a national project the Dutch traffic safety organisation 3VO is developing strategies for 'sustainably safe' school surroundings.

There is a tendency to create school concentrations in new town quarters, the so-called 'school-islands'. These are questionable from the points of view of accessibility and traffic safety. Concentrating schools in stead of distributing them about neighbourhoods creates longer distances and enhances car use. It is likely to increase safety problems, both because of the longer school routes for those travelling otherwise and because of the volume of car traffic around the schools.

The school-island may take different shapes:
- a loose collection of buildings, sometimes including sporting facilities
- separate buildings connected by covered walkways
- a complex with separate wings having access to common facilities.

The concept seems to be more or less self-evident, applied as it is in many places. This in spite of a traditional love of small local schools, which are defended fiercely against threats of closure.

Recently the 'Volgerlanden' project at the town of Hendrik-Ido-Ambacht, boasted of developing the largest school-island ever, combining four primary schools with a number of supporting facilities under a common roof. The Volgerlanden is one of the so-called Vinex-areas, dedicated to housing within the framework of a national policy on physical planning, and destined to contain 4500 homes. No other schools are foreseen 2).

It was this message which made us investigate the school-island concept, scientifically unknown, as is often the case with the self-evident.

Discovering the unknown archipelago's

The first step in our research was to assess the use of the concept, since there was no systematic information at all. The oldest documented example available was the 1968 group of three schools at the city of Dordrecht, of which the 'Great Bear' mentioned before was part.

School-islands are typical of large scale urban expansion areas. It is unlikely to find them elsewhere. It would require either substantial urban reconstruction, reconstruction and relocation of a set of schools, or adding one or two new schools to an existing one.

> The authorities of existing schools are unlikely to appreciate these movements, because one important location advantage would be lost: being the nearest school for a number of children. It enlarges the share of pupils considerably. In a secularised society the religious orientation of a school is the dominant choice motive for only a minority. Especially Roman-Catholic schools are populated by children of non-believers. There are two causes for this: the relatively strong decline of this church and the dominance of this type of school in certain regions, which used to have an overwhelming RC population majority. A 1992 study showed that for only 24% of the

parents the most important reason to send their children to a RC school was its religious orientation, for 45% it was its accessibility. For 71% of the pupils of these schools it was the nearest school (SCP, 1992).

School-islands are likely to be found in municipalities with a large production of new homes. The national statistical office, CBS, has a public online databank 'Statline' containing housing production data per municipality for the period 1993 – 2002. Of the total number of 496 municipalities the top twenty were selected and one in ten of the next hundred and ten, i.e. the 30st, the 40st etc., in order to see whether school-islands could be found in municipalities with smaller numbers of new homes. The housing production was quite varied, from over 32.000 in Amsterdam via over 5000 in Assen (no. 20) to 1400 in Naaldwijk (no. 130).

Dutch primary schools can be found in the online databank Briweb. It mentions independent schools and official satellites per municipality, but not so-called 'dislocations', temporary satellites. As a rule dislocations are the result of an amalgamation of different schools, which stay within their original buildings, by lack of one large new building. It implies that the number of school-islands found is an underestimation.

By comparing the zip-codes of the schools and, after that, the addresses of local schools one may find adjacent ones. Again one may miss certain ones, occupying one ground but being oriented towards different streets.

A commonwealth of school-islands

The analysis confirmed our expectations: school-islands are a common phenomenon. Only three out of 31 one selected municipalities showed negative results, all of those belonging to the control group with a smaller housing production.

Comparison of the number of school-islands and the percentage of schools included in these shows that concentrations of more than one school are rare.

The relationship between the volume of housing production and number of school-islands is pretty weak. This may have different explanations: the number of houses built in small scale (reconstruction) projects, the number of school-islands built before 1993 and the local taste for the concept.

Local taste no doubt is important. Amsterdam, with the largest housing production has 19 school-islands, Rotterdam, number three, has only one.

Relatively new towns like Almere, Hoofddorp (near Amsterdam) and Zoetermeer (near The Hague, 's-Gravenhage) have large numbers of schools on islands, and nevertheless more individual schools.

Table 1. The number of schools in school islands related to the total number in municipalities with an expanding number of dwellings.

Gemeenten	Hoofdkern	Tot. aantal scholen	aantal scholeneilanden	% scholen op een scholeneiland
Haarlemmermeer	Hoofddorp	28	6	42.90%
Zoetermeer	Zoetermeer	40	8	40.00%
Almelo	Almelo	23	4	39.10%
Barendrecht	Barendrecht	12	2	33.30%
Zwolle	Zwolle	41	6	29.30%
Skarsterlân	Joure	7	1	28.60%
Almere	Almere	67	7	22.40%
Papendrecht	Papendrecht	9	1	22.20%
Amsterdam	Amsterdam	194	19	20.60%
's-Hertogenbosch	's-Hertogenbosch	30	3	20.00%
Best	Best	10	1	20.00%
Delft	Delft	26	2	19.20%
Tilburg	Tilburg	47	4	19.10%
Enschede	Enschede	54	5	18.50%
Amersfoort	Amersfoort	38	3	18.40%
Assen	Assen	22	2	18.20%
Apeldoorn	Apeldoorn	54	4	14.80%
's-Gravenhage	's-Gravenhage	139	10	14.40%
Middelburg	Middelburg	15	1	13.30%
Hoogeveen	Hoogeveen	16	1	12.50%
Utrecht	Utrecht	69	4	11.60%
Groningen	Groningen	36	2	11.10%
Heerlen	Heerlen	21	1	9.50%
Helmond	Helmond	29	1	6.90%
Breda	Breda	35	2	5.70%
Dordrecht	Dordrecht	39	1	5.10%
Eindhoven	Eindhoven	59	1	3.40%
Rotterdam	Rotterdam	165	1	1.20%
Weert	Weert	18	0	0.00%
Culemborg	Culemborg	12	0	0.00%
Naaldwijk	Naaldwijk	6	0	0.00%

Possible motives for applying the concept

It is quite puzzling why generations of town planners have planned concentrations of schools in stead of traditional solitary schools in new urban neighbourhoods. One can imagine a number of possible motives, some of which are accessibility oriented:

a. simplifying design and allotment by having to provide only one location for schools,
b. making possible a better pedestrian access, with a radial system of footpaths,
c. creating a social and cultural heart for the new town quarter, by combining schools with shops and a community centre,
d. providing equal access to schools for children from different neighbourhoods, thus preventing a social cleavage between different schools,
e. providing equal access to schools with different religious backgrounds, thus promoting a conscious choice for a certain type,
f. enabling the addition of required facilities, like a gymnastic hall, which otherwise would require pupil transport,
g. enabling the addition of related facilities, children's day care or pre- and after school care,
h. reducing construction and usage cost by concentrating and sharing facilities,
i. increasing flexibility (and economy) in the face of fluctuations of pupil numbers of individual schools, opening the possibility to reassign parts of buildings to a different school.

Motives found

A literature search was undertaken to find out which of these arguments were actively used. A few municipalities were contacted to hear whether these were using the same arguments. In recent literature we found two motives: g and c, respectively parent-oriented and

community oriented.

There seems to be a general crave for creating a wide choice of child care and education oriented services in one place, to improve the quality of education and facilitate parents' busy lives by enabling them to deliver their dependent offspring at one address only. The concept is called 'the broad school' (de brede school).

A second idea is that the school should be placed in the heart of the community, to stay in close contact with its life and members and in this way being able to provide the most adequate education. It sounds like the 'town-quarter-thought' of the 1950's (wijkgedachte), kin to Perry's 'neighbourhood unit formula' of the US twenties. It reminds too of a 1970's Dutch tendency to create 'multifacs', multi-facility complexes as a last resort for village life or as an opportunity for new town centres. In the Enschede town-quarter 'Roombeek', some years ago stricken by an enormous fireworks explosion, such a facility is being developed. Both strivings are bound to stimulate the concentration of primary schools, but not necessarily in one building. Argument h, reducing cost, does. Municipal officials tend to present this argument for creating school-islands, adding argument i, flexibility.

The combination of arguments seems to lead to larger school concentrations than before, like the 'Volgerlanden' school-island, located near a small shopping centre and a health centre at the central park of the VINEX quarter.

Figure 1. The Tilburg 'Reeshof' town quarter with an eccentric school island.
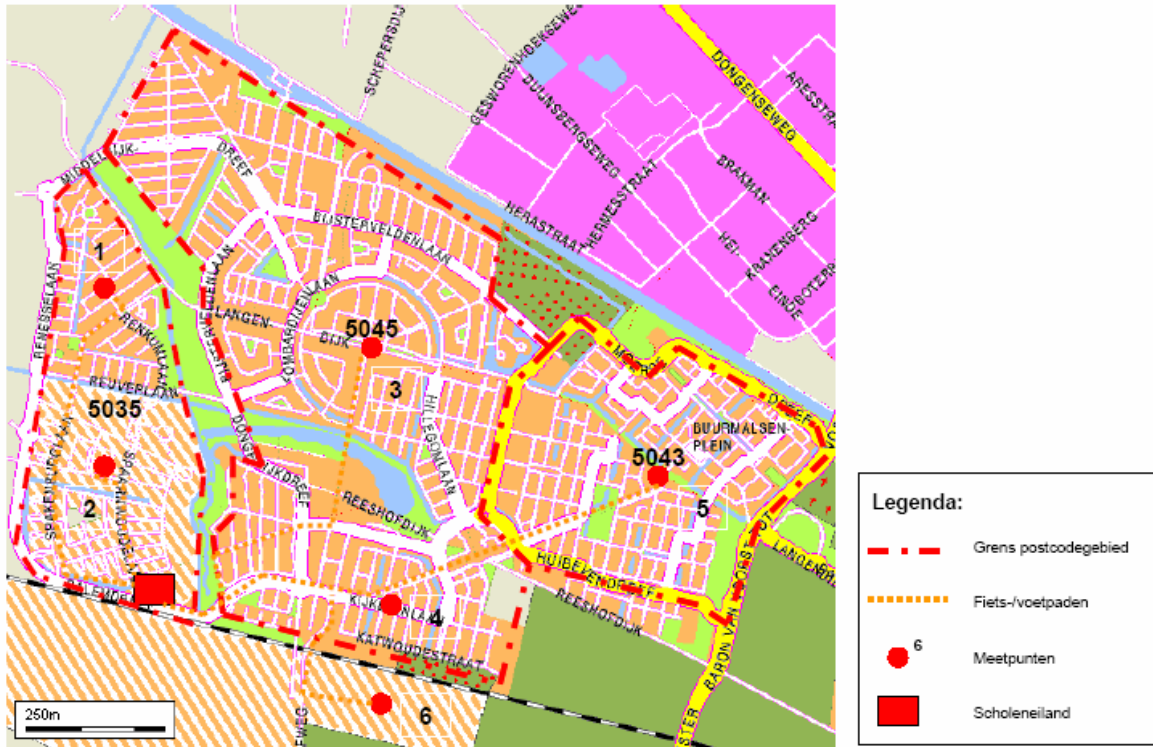
Accessibility impacts

Whatever the validity of the arguments used (propinquity based communities?), there seems to be an ongoing tendency to concentrate primary schools in new town quarters. But what about accessibility? It is self-evident that concentrating implies increasing the distance to the primary schools. In the case of the 'Volgerlanden' concentrating the four schools in stead of spreading them simply doubles the mean distance to school from an estimated 375m to 750m.

> This constitutes a problem for the schools themselves. The new quarter is bordered to the north and south by existing town quarters of Hendrik-Ido-Ambacht and Zwijndrecht with schools nicely spread about them. It means that these schools are nearer for a large part of the Volgerlanden population. Only a conspiracy between the old and the new schools might make parents send their children to a distant school.

The location of the schools and the network of roads, cycle routes and footpaths might offer some compensation for larger distances. An analysis of the accessibility of a number of school-islands and school transport to these showed that this is in no way guaranteed. There

are large differences though.

A three-school-island in the town of Delft, once famous for its traffic calming, was located in the centre of the 1970's 'Tanthof' quarter. It could be reached very well via foot- and cycle routes and only with difficulty by car. Only % of the ca. 700 pupils was brought by car.

A recent three-school-island in the Tilburg VINEX area of 'Reeshof' is located at the outskirts of the town quarter, directly accessible form a main artery road but provided with a decent foot- and cycle-network as well. In spite of unusually ample parking facilities and a kiss-and ride strip traffic is a mess, especially when parents are picking their children up after school (figure 1). The schools are not full-grown yet, with a majority of the pupils in the lower grades.

At the 'Volgerlanden' four-school-island's temporary location in the middle of nowhere, with homes only on the Hendrik-I.A. and Zwijndrecht borders, the schools are at less than a quarter of their intended strength and parking traffic is becoming pretty messy with only 25 usable places. According to the location leader the final location with some 1200 pupils will have no parking capacity at all.

The bank may stop the ship as the proverb says, but not without severe damage to the ship!

Notes

1. In existing town quarters it is difficult to implant a voluminous object like a new school, but often older ones can be reused and urban renewal may create opportunities for new locations.

2. This project is filling the gap between the built-up areas of the towns of Hendrik-Ido-Ambacht and Zwijndrecht, southeast of Rotterdam.

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