

# 社会的機能を有する道路空間の実現手法に関する研究

—オランダのボンエルフを例に—

坪原 紳二

## Reviving the Social Functions of Streets

—The Case of the Woonerf in the Netherlands—

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**Abstract:** The woonerf is a type of street where pedestrians and cars share the street space, with priority given to the former. The woonerf was invented in the Netherlands in the 1960s, with the goal of reviving social functions in the street. Its number dramatically increased in the 1970s and 1980s. The aim of this paper is to elucidate the historical development of the woonerf in the Netherlands up to today. The woonerf was first proposed as a separate system, which has been replaced by the shared system since the 1970s. The means to the goal has shifted from using effective design to enforcing a strict speed limit. While the woonerf has not always been welcomed by residents, there have consistently been citizens' organisations that promote it to the public. Although a much cheaper alternative, the 30-km/h zone, is now available, woonerven are still maintained and even being installed in the Netherlands.

**Keywords:** the Netherlands, woonerf, home zones, shared space

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## 1. Introduction

The woonerf, a Dutch word literally translated as a residential yard in English, is a type of street where pedestrians and cars share the street space on the condition that pedestrians can use the entire width of the street. It should not be confused with the so-called shared space where pedestrians have to stay on the sides of the street.

The woonerf was invented in the Netherlands in the 1960s, with the goal of creating a street not only with a traffic function but also with social functions, or a street where neighbours encounter each other on a daily basis and children play freely, as was the case in the past. Since then, the woonerf has spread to other countries in Europe and beyond.

According to Hamilton-Baillie (2008, 167), the development of the woonerf seems to have stopped in the Netherlands immediately after it was legalised in 1976. In fact, the number of woonerven (the plural of woonerf) started to increase dramatically after the legalisation, and there are still many woonerven in the Netherlands, with new ones being installed. During this long history, the design and legislation have significantly changed in the face of social responses to the woonerf. The history must contain important lessons in reviving a street with social functions in modern society. The aim of this paper therefore is to study the historical development of the woonerf in the Netherlands over more than fifty years.

Many studies have been conducted on the effects of woonerven on traffic, social life, and the environment (for

example, GH, 1981; Kraay, 1986). Historical studies on the woonerf, however, have been limited, and focused on the design of woonerven in new towns, or so-called cauliflower neighbourhoods (Van Gameren and Mooij, 2010; Ubink and Van der Steeg, 2011). This paper studies woonerven mainly in old neighbourhoods, and analyses not only the design but also the legislation and social responses to the woonerf.

The study was conducted by collecting and analysing written materials. The author visited the National Library of the Netherlands in December 2018, and searched for materials using the keywords 'woonerf' or 'woonerven'. The author used Delpher, the online search engine at the website of the national library, and searched for related newspaper articles from 1965 to 1995, until when newspaper articles are digitally registered, using keywords 'woonerf' or 'woonerven'. The author also searched for related materials with Google, using keywords 'woonerf' or 'woonerven' and 'nederland'.

In addition, the author sent questions to and received responses from the City of Delft and the City of Leiden, both of which installed a relatively high number of woonerven in the past.

In the following sections, the paper follows the historical development of the woonerf in chronological order.

## 2. The Original Woonerf

The term woonerf was first used by Niek de Boel, the then chief of the department of urban design of the fast-growing City of Emmen, at a lecture in 1965, when the department was making a plan for the new town Emmerhout using woonerven (De Boel, 2005, 81).

According to him, the street in the past served not only as a conduit of traffic but also as the core of community where children played and people encountered. The street had lost this square-like function thanks to the increase of car traffic, which impoverished neighbourhood life. On the other hand, '[w]e are still so attached to the car that we want to have it close to home'. He therefore had to provide 'garages and parking spaces close to home' (De Boel, 2005, 85-6).

To solve this dilemma, following the preceding new town Angelslo in Emmen, he designed Emmerhout in accordance with the Radburn layout, which consisted of cul-de-sacs and pedestrian and bicycle paths leading to

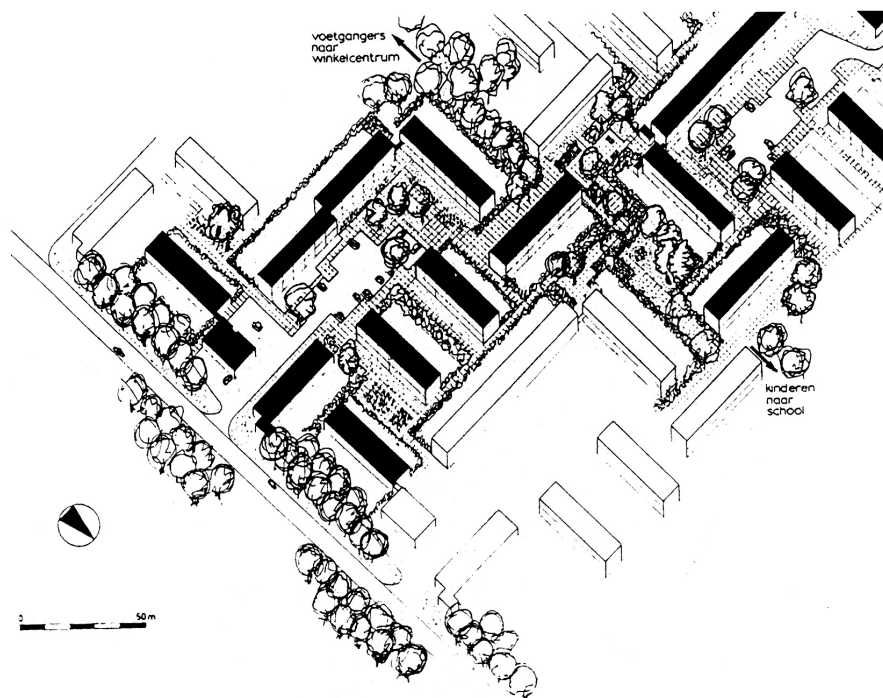


Figure 1. The woonerf proposed by Niek de Boel (De Boel, 2005, 86)

community facilities without crossing car traffic. The street space of the cul-de-sacs was not for through traffic, but still for car traffic, including parking. What was new with Emmerhout was that he created 'intermediate areas' between the street space and houses around it. The intermediate areas, a kind of extended sidewalks, consisted of 'a series of cosy small spaces' with 'sand boxes', 'play equipment', 'benches', and 'a flower bed', and were linked to the pedestrian and bicycle paths on the opposite side of the street. He called these 'pedestrian spaces' *woonerven*, which should 'become genuine encounter places' (De Boel, 2005, 85–6) (Figure 1).

Therefore, '[i]n the original model' of *woonerf*, 'car traffic was strictly separated from bicycle and pedestrian traffic and play opportunities' (Bach, 2006, 7.1). He did 'not want to be associated with the latter-day version' (Van den Boomen, 2001), or 'a nearly caricatural compromise', which is characterised by the 'unfortunate mixture of various sorts of traffic and nota bene children's play!' (Bach, 2006, 7.1).

In the 1960s, the urban design of Angelslo and Emmerhout attracted attention from across the Netherlands and even from abroad (NVHN, 1969), and the new town Lewenborg in Groningen tried to incorporate the original idea of the car-free *woonerf* at the beginning of its planning (NVHN, 1968). It turns out, however, that the original model, or 'genuine *woonerven*', as proposed by De Boel was realised only in Emmerhout (Nio, 2010, 5), although the term itself has far outlived the model.

### 3. The New Type of *Woonerf*

The City of Delft, like other Dutch cities, had plans to drastically improve its infrastructure for car traffic in the 1950s and 1960s, even at the expense of the historic fabric of its inner city. Students in architecture and urban design in the city, particularly those at the Delft University of Technology (Technische Universiteit Delft, TU Delft), campaigned against those plans with residents (De Volkskrant, 1974), and some decided to work at the city office early in the 1970s to change its practice 'from inside' (Váhl, 1985, 10). One of them, Joost Váhl learned urban design at TU Delft from De Boer — who taught there from 1969 — and worked at the Department of Public Works of the city in 1970 and 1971. In an effort to make public space, which had been dominated by the car, 'again usable for human beings' (Bach, 2006, 2.5.2), Váhl's design team introduced a new type of *woonerf* not only in new towns but also in old neighbourhoods (Bach and Zomervrucht, 2009, 66).

The team created this new type of *woonerf* by installing speed humps — for the first time in the Netherlands in 1970 — at regular intervals, placing parking spaces alternately on the left and right sides so that drivers were forced to proceed in a zig-zag line, narrowing streets with bollards and trees, and placing planters, sand piles, and bicycle racks on streets (De Telegraaf, 1974; De Volkskrant, 1974, 1975; NRC, 2001). In addition, departing from the original model, the team removed the separation between the sidewalk and the roadway to intentionally create uncertainty in road design. According to Váhl, 'ensure that it looks dangerous, and it is exactly safe' (Van den Boomen, 2001), because people then must rely on eye contact rather than physical or legal protection.

The director of the Department of Public Works K. Havinga allowed the team to do such 'crazy things' (Váhl, 1985, 10). In his view, the traffic system separating cars from pedestrians and bicycles, like the original model of *woonerf*, requires too much space to be used both 'in old and in nearly all existing new neighbourhoods'. In addition, he said, such a system is not consistent with human behaviour: 'a large part of children play on parking squares, garage courts, and approach roads' even in neighbourhoods based on the separate system (VNG, 1976, 56), as the photo of Emmerhout (Figure 2) shows. It had become the city's policy to design the inner city as a whole as a *woonerf*. The city's plan defined the *woonerf* as a 'street in residential areas where motorised traffic is still allowed, but subjected to strict and special regulations for driving and parking' (De Volkskrant, 1974). By the middle of the 1970s, nearly eighty streets in Delft had been converted into *woonerven* (Het Vrije Volk, 1975a).



Figure 2. Children playing on a street in Emmerhout (LC, 1976)

To see woonerven, planners and students in planning flocked to the city, and residents in Westerkwartier, a nineteenth-century neighbourhood whose streets were entirely repaved as woonerven, even felt their privacy threatened by too many excursions from inside and outside the country (Het Vrije Volk, 1975b). Learning from Delft, Enschede, Tilburg, Gouda, and Utrecht experimented with woonerven in old neighbourhoods (Nio, 2009, 4) while other cities such as Spijkenisse planned woonerven in new neighbourhoods (De Volkskrant 1975; Het Vrije Volk, 1973).

It was citizens' organisation Stop de Kindermoord, or Stop the Child Murder, that promoted the use of woonerven among municipalities. Early in the 1970s, three thousand people died in traffic accidents in the Netherlands every year. Particularly, a newspaper article with the headline 'Stop de Kindermoord' in 1972, which was written by a journalist whose daughter was killed by a traffic accident, prompted some parents to establish an organisation with the same name in Eindhoven, with the aim of promoting traffic safety for children (De Telegraaf, 1982). Children are officially not allowed to play on the roadway, but they still play there even if there is ample space specifically designed for playing elsewhere, because the street is an excellent place for playing, according to the organisation. Therefore, 'people must not seek a solution by the child'; rather, 'the street must be designed differently' to accommodate children playing on the street (Schepel, 1979a, 5). In addition, the sidewalk does not help since it is 'too small for most types of playing' (SDK, 1980, 6). To the organisation, woonerven as were being installed in Delft seemed ideal. With the goal of converting 'all residential neighbourhoods into safe woonerven' (DVN, 1973), the organisation campaigned for the street design through nationwide activities. It published a brochure about woonerven to help residents' groups to realise woonerven in their municipalities (NVHN, 1975), went to The Hague to lodge a petition with the national government, and granted a statue and certificate to Havinga because the City of Delft did 'everything to transform old and new neighbourhoods into safe woonerven' (De Volkskrant, 1974).

#### 4. The 1976 Legislation

Following Delft, about forty municipalities had experimented with woonerven by the middle of the 1970s, but most of them 'remained limited to very modest proportions' (Het Vrije Volk, 1976). One of the reasons for this limited use of woonerven was the lack of a legal basis for the woonerven. Although the design of woonerven suggested that pedestrians had priority over cars and that children were allowed to play on the street, the

traffic law, whose speed limit was 50 km/h or higher, did not guarantee such suggestions (De Volkskrant, 1975). In woonerven, motorists legally did not have to drive as slowly as pedestrians (Trouw, 1976). In the case of a collision with a pedestrian in a woonerf, a motorist could resort to the traffic law that gave priority to the motorist (De Volkskrant, 1975).

Vahl, the pioneer of the new type of woonerf, had 'a dislike for traffic signs', reluctant to introduce a legal basis for the woonerf (Van den Boomen, 2001). He rather believed in the power of design: 'the desired use must be logically regulated and forced with the help of design' (Vahl, 1985, 68). Municipalities and the police, however, pressed the national government to resolve the discrepancy between traffic regulations and the behaviour facilitated by the design of woonerven by creating a legal framework specifically for the woonerf (Het Parool, 1976; VNG, 1976, 7).

In response, the Minister of Traffic and Water Management requested the Association of Netherlands Municipalities to organise a working group whose task was to give advice about traffic regulations specifically for the woonerf and develop design requirements for applying these traffic regulations (MVW, 24). The Working Group Woonerven was formed in January 1975, and completed its final report, Woonerven, in 1975, which was submitted to the minister.

Making recommendations about traffic regulations in the report, the working group refrains from specifying a speed limit for the woonerf. In the group's view, such a speed limit as 20 km/h wrongly suggests that 'this is also a safe speed in any cases'. In addition, it is unrealistic to install radar traps in woonerven in order to catch going over the speed limit. The group therefore recommends the following wording for the speed in woonerven: 'drivers must ride at a very modest or still slower speed; they must even bring their vehicle to a halt if necessary' (VNG, 1976, 34).

Although this 'responsible speed must result from the design' of woonerven (VNG, 1976, 11), the group does not want to stipulate design requirements exhaustively in order to facilitate variety within the woonerf. Exceptionally, however, it comes up with two detailed requirements for woonerven.

First, the group recommends that speed calming measures be placed at a regular interval, at most every 50 m, in woonerven. The maximum interval is based on a 1970 study concluding that most drivers significantly increase their speed after about 50 m on a straight road without encountering any obstacles (VNG, 1976, 27–28).

Second, the group regards it as an 'essential precondition for woonerven' to remove the separation between the roadway and sidewalk because, precisely with this design feature, road users understand that the woonerf is 'a special area where different traffic behaviour is appropriate'. It is very expensive, however, to level the surface of an existing street with sidewalks. The group therefore accepts a woonerf with sidewalks, on the condition that the entrance to the woonerf is level 'over a distance of, for example, about 25 m', and that the sidewalk is broken up with speed calming measures 'at a regular distance of, for example, maximum 25m' (VNG, 1976, 29).

The cabinet agreed to add regulations for the woonerf to the Act of Traffic Regulations and Traffic Signs (Reglement Verkeersregels en Verkeerstekens, RVV) on 14 May 1976, and the Stop de Kindermoord organised the National Woonerf Day in twenty-one cities next day to commemorate the legalisation of woonerven (NRC, 1976). On 15 September 1976, the new regulations for the woonerf and accompanying design requirements were put into force.

Among the new regulations, from article 88a to article 88e, the first article 88a establishes the right of pedestrians to use entire road space in a woonerf, stating, 'Pedestrians may use roads within a woonerf designated as such over the full width; playing is allowed on these roads.' Subsequently, article 88b, which is about the speed in woonerven, follows the recommendation by the working group by not specifying a speed limit, just stating, 'Drivers must not ride faster than at a walking pace (*stapvoets*) within a woonerf' (MVW, 1985, 21). The reason for

this article is, according to the Minister of Traffic and Water Management, 'on a road that can be used equally not only by motor vehicles but also by pedestrians, the speed of these road users must be as same as possible' (MVW, 1985, 26). The phrase 'at a walking pace' therefore seems to mean the pace of pedestrians.

Apart from these regulations about traffic behaviour, article 132b in the RVV stipulates a new traffic sign for the woonerf with a white house on a blue ground. The traffic sign, according to the article, can be placed 'only if the requirements are met that were decided by Our Minister and announced in the Netherlands Government Gazette' (MVW, 1985, 22).

These design requirements are presented as fourteen articles.

The first article, article 1, stipulates where the woonerf can be installed, namely, '[t]he woonerf must have a mainly residential function' (MVW, 1985, 29).

Article 4 is about the sidewalk, which, in principle, should not be in a woonerf:

The impression must be avoided that the road is divided into a roadway and a footpath or sidewalk. There must not be a continuous difference in height, therefore, in the cross section of a road within a woonerf.

The article, however, following the recommendation by the working group, leaves room for a sidewalk, stating, 'Edges that give an impression of a footpath or sidewalk separated from a roadway must be interrupted at a distance of about 25 m' (MVW, 1985, 29).

Article 6, which earned 'a prize for incomprehensible use of language' from the Stop de Kindermoord (Schepel, 1979b, 12), states that the entrance to a woonerf must be clearly recognisable as such through its design. This can be achieved, according to the article, by extending the curb of the crossing street over a woonerf, or placing the entrance to a woonerf 'at some distance back from' the crossing street (MVW, 1985, 30).

Article 7 is about the place of on-street parking in a woonerf; article 8 is about the amount of on-street parking there, which does not have to meet all parking demand by residents in a woonerf, but which should not be too little to cause a shortage of parking in nearby neighbourhoods (MVW, 1985, 30).

Article 9 is related to the other detailed recommendation by the working group: speed calming measures must be placed in a woonerf, and the 'mutual distance between these measures must not be larger than 50 m' (MVW, 1985, 30).

Finally, article 14 requires that a board with the word woonerf be placed beneath the new traffic sign of the woonerf (MVW, 1985, 31).

## 5. Woonerven in Practice

### (1) Obstacles

Once woonerven were legalised, many more municipalities started to install them. In 1980, 309 municipalities, or nearly forty percent of all municipalities, had one or more woonerven (CBS, 1982, 38). The number of woonerven steadily increased nationwide in the 1980s, as shown in **Table 1**.

Three quarters of these woonerven, however, were located in new towns, among others, the so-called growth centres (*groeikernen*), such as Zoetermeer and Spijkenisse, which were developed in the 1970s and 1980s to accommodate population overflowing from large cities in the Randstad, the south-west region of the Netherlands. Incorporating woonerven from the planning stage, neighbourhoods in these new towns entirely consisted of woonerven. Because of the appearance of their street network, they were called cauliflower, maze, or macaroni neighbourhoods (Wassenberg and Lupi, 2011, 9-10, 12).

Although the need for play space was more pressing in old neighbourhoods (Het Parool, 1977b), it was difficult to convert existing streets into woonerven there (**Figure 3**), particularly in large cities such as Amsterdam. At first, the Stop de Kindermoord estimated converting an existing street into a woonerf to be at least 25 to

Table 1. The number of woonerven in the Netherlands

year	number of woonerven
1980	1,691
1983	3,128
1985	4,002
1988	5,059
1992	6,612
1996	3,955

(CBS, 1997, 18)



Figure 3. A woonerf in an old neighbourhood in Groningen

35 percent more expensive than just repaving the street (Het Vrije Volk, 1976). In fact, the installation cost of woonerven in old neighbourhoods differed widely among municipalities, and, in some municipalities, the cost significantly decreased later by using more sober design (GH, 1981, 32; MVW, 1985, 7).

To installing woonerven in old neighbourhoods, the more formidable obstacle than the installation cost was the design requirement about the amount of on-street parking in a woonerf. On-street parking in woonerven was allowed only within designated spaces, which were usually for angle parking and placed alternately on the left and right sides to slow down cars. Compared with existing parallel parking on both sides of a street, the number of parking spaces could significantly decrease. Then, according to article 8, at least a part of lost spaces must be compensated for nearby, for example by building a parking garage — a difficult task particularly for large cities with densely built-up historical neighbourhoods (Het Vrije Volk, 1976; Het Parool, 1977a, 1977b).

There was also an unexpected obstacle to realising woonerven in old neighbourhoods. With woonerven legalised and widely known, residents increasingly requested municipalities to install woonerven in their neighbourhoods (LD, 1978). Once a municipality worked out a plan to make a woonerf and announced it, however, other residents often started to oppose the plan, which led to a controversy between the municipality and residents or between supporting and opposing residents.

The most outstanding cases among such controversies were related to two demonstration projects in Rijswijk and Eindhoven, which were selected for subsidies by the national government in 1977, intended to study the effectiveness of various speed calming measures (De Volkskrant, 1977). In both projects, the municipalities planned the most drastic measures, namely woonerven, for some neighbourhoods, where residents started to strongly oppose the plans once they understood what woonerven looked like. They feared that they would no longer be able to park their cars in front of their houses, streets would become rather more dangerous by losing sidewalks, or woonerven would make their streets ugly and consequently drive down their house prices (De Telegraaf, 1981; Trouw, 1981a; NRC, 1982). There were also residents who supported woonerven, and, in Eindhoven, the conflict between the opponents and proponents became so intense that it was even compared to the civil war in Northern Ireland (Het Parool, 1982). Despite such strong opposition, since both projects were generously subsidised by the national government, the municipalities could not afford to give up the projects, completing them in 1982, two years later than planned (Figure 4) (Trouw, 1981b; NRC, 1982).

Since the woonerf was legalised in 1976, the Stop de Kindermoord had received a subsidy from the Ministry of Traffic and Water Management to promote the woonerf. It employed three full-timers, in addition to many



Figure 4. A woonerf in Rijswijk today

volunteers, and put emphasis on stimulating local groups into action for woonerven (NVHN, 1979). Through contacts with these groups, it found how prevalent the opposition to woonerven was, not only from municipalities but also from residents themselves. It therefore published a booklet in 1979 that presented various negative views on woonerven, as shown above, and that provided counter-arguments against those views (SDK, 1979).

Partly because of these obstacles to realising woonerven, many of them did not meet the design requirements shortly after the woonerf was legalised. The Directorate Traffic Safety of the Ministry of Traffic and Water Management continuously studied whether woonerven met the requirements although the ministry had no authority to correct faulty woonerven. According to its inquiry from 1976 to 1979, about 80% of woonerven did not meet the requirements, leaving the roadway and sidewalk separated or failing to place speed calming measures effectively (GH, 1981, 27). These woonerven were ruled illegal in court in 1979, no longer allowed to place the traffic sign of the woonerf (De Telegraaf, 1979). On the other hand, the quality of woonerven was quickly improved (GH, 1981, 28), and according to the inquiry by the ministry from 1981 to 1982, 75% of 'streets designed as woonerf' showed 'no' or 'slight deviation' from the design requirements (MVW, 1985, 7).

## (2) Effects

Although residents often opposed woonerven at first, they were generally satisfied with woonerven once they were put into use (MVW, 1985, 8). According to a national sample survey, for example, 70% of the population found the woonerf desirable or very desirable whereas 14% found it undesirable (Kraay, 1986, 5). They were positive about the woonerf, however, because of its peaceful atmosphere or green facilities, not because of its traffic safety (Kraay, 1986, 7). For most residents, the speed of cars was still high in woonerven, where children could not play safely while the elderly missed the sidewalk (MVW, 1985, 8).

After the demonstration projects in Rijswijk and Eindhoven, residents were asked whether traffic safety on their streets were improved. Those in neighbourhoods where woonerven were installed were less positive about this question, compared with those in neighbourhoods where less drastic measures were taken. Nearly half of residents in woonerven found that their streets became less safe because there were no longer sidewalks (Trouw, 1985).

According to studies about woonerven in Enschede in the late 1970s, 92% of residents found that woonerven improved their environment. As far as traffic safety was concerned, however, more than half of residents were negative about woonerven (GH, 1981, 28–29).



Studies about woonerven in Helmond, which were all installed in old neighbourhoods in the late 1970s, revealed that 56% of residents found that woonerven improved their environment whereas 18% found that woonerven worsened it (GH, 1981, 88). On the other hand, as far as traffic safety was concerned, they were again not so positive: 37% of residents found that woonerven did not create an area where pedestrians and children could use the entire street and where cars adjust their speed and behaviour, whereas 32% found that woonerven did create such an area (GH, 1981, 74). According to half of residents, woonerven did not reduce the speed of cars (GH, 1981, 111), and particularly parents with young children did not like the situation where cars and pedestrians must use the same lane (GH, 1981, 81).

With cars driving too fast, some woonerven were so dangerous for pedestrians and children that residents had to initiate action in order to improve the 'deadly situation' (Het Vrije Volk, 1978b). They collected signatures to appeal to municipalities (LD, 1979, 1981), gave drivers a pamphlet telling traffic rules in the woonerf (LC, 1985; NVHN, 1982), staged a demonstration for safer woonerven (Trouw, 1982), or even blocked a woonerf to cars (NVHN, 1986).

According to speed measurements, however, woonerven did reduce the speed of cars significantly. Speed measurements in some cities such as Helmond, Rijswijk, and Eindhoven revealed that the average speed of cars in woonerven was lower than in traditional streets: 13–25km/h (MVW, 1985, 8). Although woonerven installed in the demonstration projects in Rijswijk and Eindhoven did not improve traffic safety in the view of residents, they in fact reduced car speed more significantly than less drastic measures, which residents found more effective in improving traffic safety (Kraay, 1986, 11).

As a result, according to a study of 56 woonerven commissioned by the Ministry of Traffic and Water Management, woonerven also reduced the number of traffic accidents significantly (MVW, 1985, 9). In Helmond, neighbourhoods where woonerven were installed saw 40% less traffic accidents on three-year average than other neighbourhoods (GH, 1981, 39).

Woonerven therefore statistically improved traffic safety, but the speed of 13–25km/h was still faster than a walking pace, the legal speed limit in the woonerf. In addition, there were no longer sidewalks; instead, various objects, such as flower boxes, bicycle racks, benches, and trees, as well as cars were placed here and there to lower car speed, forcing pedestrians to walk in the middle of the street while blocking the view of drivers and children (Het Vrije Volk, 1981b; Kraay, 1986, 12; LD, 1979). The improved traffic safety statistically established, therefore, did not lead to a higher sense of safety among residents in woonerven.

Some blamed the design of woonerven for 'driving too hard' (Het Vrije Volk, 1981a; NVHN, 1985; Trouw, 1983). According to Váhl, even Delft, the 'shining example' (Het Vrije Volk, 1976) of woonerven, had 'never completely succeeded in physically making it impossible to drive hard' (Váhl, 1985, 72). The Stop de Kindermoord criticised municipalities for not choosing to 'really make a street for pedestrians and playing children', and listed various deficiencies in the design of woonerven, such as 'unnecessarily wide' road space, 'too spacious' curves, and 'way too flat' speed humps (Schepel, 1980, 16). Complaining about dangerous woonerven, residents across the country demanded that municipalities should add speed humps or raise their height (Het Vrije Volk, 1978b; LC 1985, 1986; LD, 1984). Woonerven indeed could have these problems in design even if they met the legal design requirements.

On the other hand, many drivers did not know that the speed limit in the woonerf was a walking pace. Although Dutch drivers were not familiar with traffic regulations in general, their knowledge about them in the woonerf was particularly poor. For example, 60% of them wrongly believed that the speed limit in the woonerf was 30 km/h (Het Vrije Volk, 1986). Even residents in woonerven themselves did not necessarily know about traffic regulations there: according to a study, 56% of them were able to mention more than one regulation in the

woonerf (MVW, 1985, 8). To fill a gap in knowledge about traffic regulations in the woonerf, residents in some neighbourhoods circulated brochures about the woonerf (LC, 1985; NVHN, 1982), and the Stop de Kindermoord explained the regulations in its publication (Schepel, 1979b).

The speed limit in the woonerf, however, was difficult to disseminate because it was unclear what a walking pace exactly meant. For some, it was the walking pace of a pedestrian, 5 km/h (GH, 1981, 37; Het Vrije Volk, 1981a; Kraay, 1986, 7; LD, 1979), as was probably intended at first. For others, it was the walking pace of a horse, 15 km/h (LC, 1986; NVHN, 1982), an interpretation that prevailed later.

## 6. The 1988 Legislation

Since the late 1970s, shopping streets and streets in city and village centres had been converted into streets like woonerven, called *winkelerf*, *stadserf*, and *dorpserf*, respectively. Located outside residential areas, these streets were not subject to the regulations for the woonerf, lacking a legal basis to ensure pedestrian priority. On the other hand, nearly seven years after it was enacted, the legislation for the woonerf itself was found to have some problems, as shown in the previous section. To solve these problems, the Ministry of Transport and Water Management organised the Working Group Erven in November 1984, whose goal was to propose how to modify the legislation (MVW, 1985, 5). The working group published the report *Van Woonerf naar Erf*, or From Woonerf to Erf, in September 1985.

According to the report, the working group first of all adopts the principle of proposing single legislation rather than separate legislation for each kind of erven, given the fact that the national government was trying to streamline various regulations in those days (MVW, 1985, 12). To make the regulations applicable to all kinds of erven, the working group proposes replacing the term woonerf in the regulations with erf (MVW, 1985, 14).

The group also proposes replacing the traffic sign of the woonerf, which did 'not represent the functions of the remaining erven well', with the European traffic sign of the woonerf (MVW, 1985, 14), which was adopted in 1980, when the woonerf was spreading to other European countries (Trouw, 1980).

On the other hand, although residents often complained about 'driving too hard' in woonerven, the working group still adopts the speed limit of a 'walking pace', which 'must not be replaced with a numerical speed, for example, 20 km/h'. According to the group, 'a numerical speed is dealt with as a target speed by some drivers' (MVW, 1985, 12).

While keeping changes to the regulations in the RVV to a minimum, the working group proposes substantially modifying the design requirements, which must be met to place the traffic sign of the woonerf. It leaves only six articles, instead of the original fourteen, by removing articles that are covered by municipalities' duty of care and articles that municipalities themselves should regulate (MVW, 1985, 13).

Among the remaining articles, the working group recommends replacing the term 'residential' in article 1 with 'staying' (*verblijven*) so that woonerven can be installed also outside residential areas (MVW, 1985, 14).

The group argues for keeping the principle of article 4 that a woonerf should not be apparently divided into a roadway and a sidewalk. Considering the consistent demand from residents to keep sidewalks, however, it proposes adding a sentence of 'compromise character' (MVW, 1985, 17) saying, 'On roads or parts of a road where this is desirable, a facility for pedestrians can be realised' (MVW, 1985, 14).

Thanks to the difficult wording of article 6, according to the group, the entrances to woonerven were wrongly implemented in many places. The group proposes simpler wording while specifying the distance of the entrance from the crossing street when the entrance is placed 'at some distance back from' the crossing street: 20 m at a minimum (MVW, 1985, 14).

The requirement about the amount of on-street parking, which was stipulated in article 8, made it difficult



Figure 5. The new traffic sign of the woonerf

to install woonerven in old neighbourhoods. The working group chooses to remove this requirement since a sufficient amount of parking should be guaranteed by a 'larger plan' than a plan for a woonerf (MVW, 1985, 15).

For residents who pressed for adding speed humps, the design requirement of article 9, namely, speed humps at least every 50 m, was too sparse. On the other hand, there were cases, for example, a 70 m dead-end street, where this requirement led to unnecessary humps, further increasing costs of installing a woonerf. The working group chooses to be less specific, saying that speed calming measures must be placed so that 'driving at a walking pace reasonably results from the environment'. Because the group regards this requirement as 'one of more important articles', however, it recommends moving this article forward among new articles (MVW, 1985, 15).

On 16 July 1988, the new regulations and design requirements for the woonerf were put into force. The recommendations by the working group were 'nearly entirely taken over' (CROW, 1989, 8). The new regulations replaced the term 'woonerf' with 'erf', and adopted the European traffic sign of the woonerf (Figure 5) although leaving the old sign valid until 16 July 1998 (CROW, 1989, 9). The number of design requirements was reduced to six, and the requirement for speed calming measures came second in the articles.

## 7. The Decline of the Woonerf

The 1988 legislation for the woonerf made it easier for municipalities to install woonerven, streamlining the design requirements while allowing facilities exclusively for pedestrians. Municipalities, however, had already acquired another legal measure much easier to use in order to protect pedestrians from cars.

The national government legislated a speed limit of 30 km/h in 1983, lowering the existing minimum speed limit of 50 km/h. Subsequently in 1984, the national government allowed municipalities to enforce the speed limit at a zone level, requiring the traffic sign of the speed limit only at entrances to the zone.

To introduce a 30-km/h speed limit, a street must meet some design requirements, which are not so extensive as the requirements for the woonerf, and must in principle keep the separation between the roadway and the sidewalk, as opposed to the woonerf. As a result, the costs of installing and maintaining a street with a 30-km/h speed limit were much lower than the costs of installing and maintaining the woonerf. Indeed, the installation cost of the woonerf can be significantly reduced, but maintaining it is still expensive<sup>(1)</sup> since the woonerf uses various kinds of unusual pavements and must be cleaned manually instead of mechanically (GH, 1981, 114; Het Vrije Volk, 1978a). With a much easier option available, whereas 41% of municipalities had concrete plans to

install a 30-km/h zone as of 1990, 15% of them had concrete plans to install woonerven (Neeskens and Kropman, 1992, 30).

When legalising the 30-km/h zone in 1984, the national government also launched thirteen demonstration projects to see the effects of the zone. The Institute of Applied Sciences in Nijmegen, which studied the demonstration projects by commission from the Ministry of Traffic and Water Management, published the results in 1991. According to the results, the woonerf 'has finished' (NVHN, 1991). In the view of residents as well as municipalities, 30-km/h zones had indeed not only lowered the speed of cars, but also reduced through traffic, increased traffic safety, and improved the environment. In addition, 86% of residents regarded the speed limit of 30 km/h as a proper speed, and 90% of them found sidewalks, which were mostly available in 30-km/h zones, necessary or at least desirable. As a result, of three types of street — a 30-km/h street with sidewalks, a woonerf, and a traditional 50-km/h street with sidewalks — two-thirds of residents gave preference to the 30-km/h street whereas one-fifth to the woonerf (Neeskens and Kropman, 1992, 67–68).

Given these results, to avoid confusion about traffic regulations, Neeskens, responsible for the study, recommended installing only the 30-km/h zone in residential areas whereas installing *erven* only in non-residential areas (Neeskens and Kropman, 1992, 70).

In fact, municipalities had not only installed much fewer woonerven than before, but also converted a large number of existing woonerven into 30-km/h streets. As a result, the number of woonerven had decreased from 6,612 in 1992 to 3,955 in 1996, a 40% decrease during just four years (Table 1). The number of woonerven became so few that statistics of them have no longer been taken since<sup>(2)</sup>.

## 8. Today's Woonerf

With 30-km/h zones widely introduced, however, it turned out that the measure had its own problems. Streets in the zones were indeed mostly equipped with sidewalks, but they were often too narrow for playing children to stay on (Fietsberaad, 2009, 9). In addition, the speed of 30 km/h could still cause serious injuries in the case of collisions between cars and pedestrians (VVN, 2012, 1). Some citizens' organisations therefore started to stress the advantages of the woonerf over the 30-km/h zone in the 2000s.

In 1993, twenty years after its establishment, the Stop de Kindermoord changed its name to the Kinderen Voorrang, or the Children Priority. In 2000, it consolidated with the historical Safe Traffic the Netherlands (Veilig Verkeer Nederland, VVN), which was established in 1932, and the Pedestrians' Association (Voetgangersvereniging). This new association first called itself 3VO, but later VVN, a familiar name among Dutch people<sup>(3)</sup>.

A study by the VVN revealed in 2005 that the age when children were allowed to play independently outside was more than one year younger in woonerven than in 30-km/h zones (KPVV, 2008, 15). The VVN advocated installing woonerven in 30-km/h zones (KPVV, 2008, 36). In 2012, it published a brochure comparing 30-km/h streets with woonerven, and emphasised that a woonerf is a 'much better alternative' to a 30-km/h street if the latter cannot provide a usable sidewalk. According to the brochure, woonerven are 'real streets for doing, experiencing, encountering, and playing!' (VVN, 2012, 2).

Those who found the woonerf a 'valuable invention' established citizens' organisation Woonerfgoed in 2011 (Van Lith, 2012). Like the VVN, it argued that the woonerf not only allows children to play on streets safely and legally, but also creates more opportunities for 'encountering and other social activities than a street with small sidewalks' (Woonerfgoed, 2011, 2).

Some municipalities have also recognised the inherent value of the woonerf, and tried to disseminate its regulations, rather than just dismissing the woonerf.

The speed limit of the woonerf was finally specified through a ruling by the district court of Dordrecht in 1998:

15 km/h (Bach and Zomervrucht, 2009, 67). Because this speed limit was not well shared among drivers, the City of Rijswijk, the site of the controversial demonstration project of woonerven, attached a sticker showing the speed limit to the existing traffic signs for the woonerf as a temporary measure (Figure 6). In March 2012, the Woonerfgoed and the advocacy group for children play Jantje Beton as well as the city submitted a petition to the Minister of Infrastructure and the Environment, asking for a new traffic sign designed after Rijswijk's measure. One month later, in April 2012, the minister allowed municipalities to add a traffic sign of the speed limit of 15 km/h to the existing traffic sign for the woonerf, instead of proposing a new traffic sign for the woonerf (Van Lith, 2012).



Figure 6. The traffic sign of the woonerf with a 15-km/h sticker

Some other municipalities have adopted Rijswijk's measure, which is cheaper and cleaner than placing another traffic sign for the speed limit of 15 km/h. For example, the City of Zoetermeer had attached the sticker to all the traffic signs for the woonerf by 2017. In addition, the city developed a flyer explaining the regulations of the woonerf, in cooperation with residents, so that residents could hand it out in their neighbourhoods (Streekblad, 2017; Puylaert, 2018).

Given also the fact that new woonerven are still being installed (Woonerfgoed, 2011, 2), the woonerf has not yet finished.

## 9. Conclusions

The more-than-50-year history of the woonerf that has been studied so far in this paper seems to reveal four important facts, or historical lessons, in realising a street with social functions.

First, it was not the separate type of woonerf invented by De Boer but the shared type invented by Váhl that spread across the Netherlands and beyond. Although the shared type was also difficult to install in old neighbourhoods, the original separate type was difficult to realise even in new towns because it required much more space.

Second, although the goal of the woonerf has been consistently to revive social functions in the street, the means to the goal has shifted from effective design to a strict speed limit. Believing in the power of design, Váhl devised various physical measures such as humps to slow down cars. Although he was sceptical about the power of law, the 1976 legislation was consistent with his prescription. It required the placement of speed calming measures at a specified interval and the removal of the separation between the roadway and sidewalk. On the other hand, it refrained from specifying a speed limit, believing that a reasonable speed can result from effective design. It turned out that drivers did not slow down enough for children to be able to play in the middle of a woonerf although they did slow down significantly. It was, however, unpractical to further stipulate precise design requirements. In addition, residents missed sidewalks, which, in their view, should be there to protect children and the elderly. The 1988 legislation therefore loosened design requirements inside the woonerf, entrusting the specifics of design to municipalities, and created room for continuous sidewalks. On the other hand, to appeal the speed limit of a walking pace to drivers, it tried to emphasise entrances to woonerven through design and a new traffic sign. With a speed limit of 15 km/h in the woonerf established

in 1998, municipalities are now attaching a 15-km/h sticker to the traffic sign of the woonerf. This shift may suggest that enforcing a strict speed limit is more essential than applying effective design in reducing the speed of cars well below 30 km/h while allowing them to drive.

Third, woonerven have not necessarily been welcomed or they have even been strongly opposed by residents. The image of the woonerf is unusual for most people, whose common image of a safe street is that with sidewalks. In addition, many residents themselves are drivers, who do not want to sacrifice the convenience of driving smoothly and parking their cars in front of their homes.

Fourth, while woonerven have been opposed, there have also been citizens' organisations that support the woonerf since the early 1970s, when the woonerf was not yet legalised. They have helped spread the regulations of the woonerf, and are stressing the inherent value of the woonerf now that the 30-km/h zone has become available. At least partly because of their efforts, there are still many woonerven in the Netherlands although the exact number is unknown.

## Notes

- (1) The City of Leiden also confirmed this by e-mail.
- (2) According to the answer by the Statistics Netherlands (CBS) by e-mail, it no longer has any statistics about woonerven.
- (3) <https://vvn.nl/geschiedenis> (accessed 2 May 2019).

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