

Identification of quality needs

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Abstract

A logical way to support walking and sojourning in public space is to start with the identification of the pedestrian's quality needs. The main aim of the identification of pedestrian needs is to provide a valid, suitable and convincing ground for stipulating requirements for pedestrian facilities.

Basic pedestrian characteristics and abilities set the stage for pedestrian quality needs: heterogeneity of the population, size and volume of a pedestrian, walking speed, action radius, a pedestrian not only walks but also sojourns, and a pedestrian is relatively vulnerable. It is therefore vital that it is clear what pedestrians are present, to be expected or wanted in the jurisdiction.

A guiding principle for the identification of quality needs and stipulating requirements is Design for All, which postulates that it is most opportune to start from the needs of persons that do not have a choice but to walk and the persons that have most difficulties walking and sojourning. Approximately 50% of the population do not have a choice but to walk and use public means of transport for longer distances (Children, persons that own a drivers licence or not a vehicle, elderly and handicapped, poverty stricken people); 30 – 40% of the population has relevant functional limitations that restrict their mobility options (Asmussen, 1996).

Lapintie (2008) classified needs according to their scope for pedestrian existence: human existence, survival; psychological needs; aesthetic needs; social needs; public/political needs.

The same basic needs can have different appearances on the four optional pedestrian activity levels: lifestyle, strategic, tactical and operational activity levels. At the *lifestyle* activity level preconditions for walking and sojourning are defined. Information, proximity of relevant destinations, to feel at home, independence, social activities, free use of public space and equity are the dominant pedestrian needs. The conditions must be Convivial, Convenient, Connected, Conspicuous and Comfortable (the 5 C's).

On the *strategic* activity level the same fundamental needs apply, but they are more concretely felt at temporary conditions and related to timely availability of opportunities. There is a difference in experienced needs between daily trips and new and incidental trips to unfamiliar grounds. For the latter certainty about conditions under way is a most relevant need. Aesthetics play a role in on-the-spot choices.

Needs on the *tactical* activity level concern do-ability of route choices, orientation, concentration on the walking task etc. and do not differ much from needs on the strategic activity level. Conspicuousness and unambiguousness are the most important needs.

Operational activity level needs touch dealing and reeling with concrete situations. The 5 C's again are dominant general needs. Apart from that, skills to cope with the actual conditions matter most. Forgivingness of conditions is a crucial need, particularly in complex and dangerous situations. Convenience bears upon functionality, feasibility and suitability of situations for the task performance in specific circumstances. Free and unobstructed use of public space, shielding from motorised traffic, adequate walking facilities and security are especially important needs for vulnerable groups like children, women at night, elderly and disabled persons.

Biography

Rob Methorst is chairman of COST 358 Pedestrians' Quality Needs and senior consultant at the DVS Centre for Transport and Navigation (NL Ministry of Transport, Public Works and Water Management). Rob has 30 years of experience in the field transport and traffic safety, both in pedestrian advocacy and in government.

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Introduction

Usually approaches to the walking and sojourning issues start with the identification of problems. In practise many actors, that can do something about the problems, sit back and wait until problems are reported. What happens is that each time they think they solved the problems, to their great frustration, new ones keep popping up. In this context it seems more sensible to focus on offering quality and prevent problems from arising. Such a strategy cannot start from reported or otherwise identified problems. In the PQN project it is argued¹ that a quality oriented approach has to start with the identification of pedestrian needs, followed by a translation of those needs into (quality) requirements concerning individual elements and structures in the pedestrian's environment, including the physical environment, transportation, the social environment and legislation, behaviour rules and enforcement. A third step then is to form an image of the desirable state of the system, which defines opportunities that the pedestrians can use to satisfy the goals they want to achieve by walking and sojourning, like keeping physically fit or human interaction, going to school, to work, shopping etc. This image of the desirable state of the system can serve as a reference standard for finding out what needs to be done to design, support, manage and maintain adequate walking and sojourning conditions. The latter, of course, is a highly political matter, but it can be fed by academic knowledge.

In this paper the very first step in policy development, the identification of pedestrian needs, is described and substantiated. It is not possible to conclusively identify all relevant pedestrian needs. After all, needs are relative. Different people have different needs. Individual and collective needs can vary with age, ability, climate, culture, lifestyle, time of the day etc. What can be done is to identify major needs and strivings that potentially lead to walking and sojourning in public space.

Bradshaw (1972) argues that there are many classes of needs relevant for policy making. The identified needs should not only include *expressed* needs and strivings, but also *normative*, *comparative* and *felt* needs. Likewise it is important not only to quest for *manifest* needs, but also for *latent* needs. It appears that some needs are suppressed or hidden, like special safety needs of the elderly and handicapped because of their decreased abilities. The elderly and handicapped themselves do not want to highlight them because they do not want to be pitied and seen as losers; such needs are not recognised socially and politically because there are no clear indications like generally available statistics and attention of the media.

Methodology to assess needs must be suited for this task of providing a comprehensive picture of pedestrian needs.

The concept of needs is defined and substantiated in Chapter 2, section 2.4. of the PQN Final Report Part A – Introduction and Conceptual Framework. It was found that needs can be distinguished from wants. A deficiency regarding the satisfaction of a need would cause a clear negative outcome, such as dysfunction or death. Needs are necessary for survival and functioning in society, whereas wants are 'nice to have'.

¹ (see PQN Final Report Part A – Introduction and conceptual framework)

In PQN with regard to needs and pedestrian behaviour four activity levels are distinguished: lifestyle, strategic, tactical and operational. These different activity levels connect to specific types of needs with regard to walking and sojourning². At the lifestyle level they relate to behavioural features that set the scene for the strategic activity level. Being a 10-year-old child in a big city (= lifestyle level) for example means that you need to go to school a few blocks away (= strategic level decision by its guardians) and that you need to be able to cross some busy streets (tactical level decision) and that you need to get some gaps in the traffic flow to actually cross the street (operational level). In other words: there will be chains of needs, which can be satisfied by adequate measures at the concerned policy levels.

Key questions with regard to the identification of quality needs for policy development are:

1. Which pedestrians can be expected to be present in the jurisdiction?
2. What kinds of pedestrian needs can be identified on various activity levels?
3. What (usable) indicators for policy relevant existing and future pedestrian needs are there?

Pedestrians in the jurisdiction.

As needs with regard to mobility, accessibility, safety and health vary for different groups of people, it is necessary to find out what the relevant characteristics of the population in the area are. An interesting concept in this context is the concept of 'New Standard Human' (in Dutch 'Nieuwe Normmens') that was introduced by Asmussen in 1996. Asmussen argued that the current road and transport systems are not sufficiently accessible for vulnerable groups like children, elderly and the handicapped. Asmussen finds that it is possible to take stock of all relevant functional limitations and their occurrence. It is also possible to identify a Greatest Common Divisor, such that 90% of the road and public space users with functional limitations are included. This is called the New Standard Human. The three main categories of limitations are:

1. *People with functional limitations.*

These individuals can make use of their residual capacity. In most cases they can and will compensate their limitations by making use of the residual capacity by using aids, like spectacles, magnifying glass, cane, walker, hearing aid, protective measures etc.

2. *People with total loss of function.*

These persons do not have a residual capacity to fall back on and cannot make use of aids that amplify or compensate the residual functionality. They can only compensate the loss of function by calling on other senses and capacities or substitute means. Thus the blind use their tactile sensitivity or hearing for orientation; people with a total loss of the walking function use a wheelchair propelled by their arms or an electric scooter. It is clear that providing for people with total loss of function calls for entirely different adjustments than for people with functional limitations. The blind need texts in Braille or sound, tactile guiding lines instead of white guiding lines; wheelchair users need sloped paths instead of stairs, no thresholds etc.

² To a substantial degree the activity levels connect to specific types or levels of policy making. The lifestyle and strategic activity levels are mostly based on fundamental decisions that are conditioned by long term (national) policies, whilst operational activities are a response to situational factors, which can be influenced on the (relative) short term on the local level.

3. People with temporary disabilities and limitations.

A large part of the population cannot easily, comfortably and safely use the current transport system and public space. These groups includes persons with temporary limitations like injuries, illnesses and disorders, drug use, alcohol use, eye inflammations, fatigue, but also clouded spectacles, carried bags, pushed prams etc. For safety sake it is necessary that large safety margins are built in the system. Currently this is often not the case. It is a wonder that so few accidents happen. The threat remains however.

In Table 1 some indicative figures on the persons with relevant functional limitations are provided, for people with functional disabilities regardless of the severity. What stands out is that the number of persons with total loss of functions is small compared to the number of persons with functional limitations. The figures will vary from country to country, but the order of magnitude will probably be correct. Because of better medical knowledge and practises the numbers will change. Demographic changes, like the ageing of the population will cause the numbers to rise substantially.

Table 1 Indicative figures on number of (partially) handicapped persons

	in Netherlands 1995	per million of population
People with total loss of function		
Wheelchair users	70,000	4,400
Blind	15,000	940
Deaf	20,000	1,250
Total	105,000	6,590
People with functional limitations		
Children 0 -14 years	2,800,000	175,000
Walking impaired	400,000	25,000
Balance disorder	400,000	25,000
Limited stamina	400,000	25,000
Visually impaired	300,000	18,750
Hearing impaired	300,000	18,750
Cognitive and mental impaired	400,000	25,000
Temporary handicapped	500,000	31,250
Parents with prams	500,000	31,250
Total	6,000,000	375,000
Source: Asmussen, 1996		

In connection to the identification of relevant groups Vukmirović (2009) distinguished 5 main groups: Children, Adults, Elderly, People with mobility handicaps and Other groups. Depending on the depth of the analysis, sub-groups can be distinguished.

In Figure 1 relative sizes of the groups are indicated for the PQN countries. The total population in the PQN countries is expected to vary little, from 456 million people in 2000 to 470 million in 2020 and 457 million in 2040³. The graph shows the effects of ageing of the population on the relative group sizes. The groups of elderly pedestrians (65–79 and 80+ years of age) will increase, whilst the groups of young people (0 – 17 years) and adults (18–65 years) will decrease. The number of severely mobility handicapped people will almost

³ Demographic data are taken from the U.S. Census Bureau, International Data Base (April 2009).

double from 28.9 million people (6.3%) in 2000 to 49.9 million people (10.9%) in 2040 (Methorst, 2010-2).

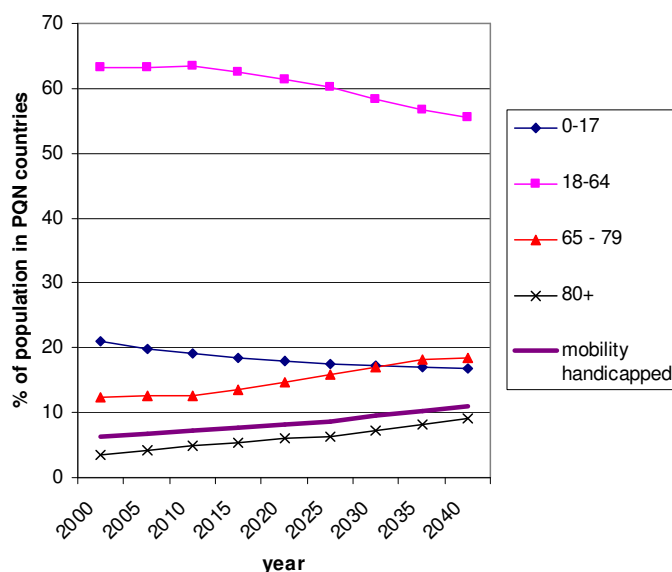


Figure 1 Share of population groups in PQN countries

How to identify needs

Because quality needs are subjective, it seems sensible to ask (potential) pedestrians what they need. This however has proved to be a very difficult and unrewarding task (Methorst, 2003; Lapintie, 2010; Risser & Chaloupka, 2009). A first difficulty is who to ask, since everyone is a pedestrian, but needs may vary substantially and not all needs will be equally important. Secondly, some basic functional needs are not recognised as a need, because they are assumed to be universally provided for anyway (the fate of common things...). Thirdly, some needs are recognised, but one is afraid, ashamed or too proud to admit them⁴. Fourthly, some needs may conflict with other needs⁵. Some needs are 'permanent' and universal, others are time or person related. In many cases individuals react predominantly on personal needs, ignoring other people's needs (Risser et al, 2009).

As it is not easy and often not practical to ask pedestrians what they need, other sources need to be consulted. From literature it appears that with regard to needs there are a large number of theories and classifications. Unfortunately there is no general consensus on what needs (of pedestrians) are. In this report we therefore choose to take the practical point of view of combining some useful perspectives and 'make the most of it'. As a consequence, in concrete (local) policy development processes, the listed needs that are presented in this report need to be verified.

With regard to expressed pedestrian attitudes, motives and needs it is appropriate to take into account that some motives and needs are relatively conscious and others quite

⁴ For example many elderly will not admit that they need support to walk and postpone acquiring a walking stick or rollator or asking for help as long as they can (Methorst, 2003).

⁵ For example the need to get somewhere in time may conflict with the need for safety or the want to enjoy the walk. The consequence can be that one takes more risks than one otherwise would do or that one gets stressed.

subconscious (Methorst & Vermeulen, 2004; Methorst, 2006). Examples of relatively conscious motives are autonomy, comfort and pleasure, responsibility, financial motives and status motives. Other needs, like consistence, obedience, competence (traffic competences, decision competences) are much more subconscious and thus harder to identify and to influence.

In many policy papers mobility, accessibility, safety and health are seen as critical aspects of urban space and the transportation system. These aspects relate to human needs that are clearly acknowledged by politicians and can be seen as guiding for policy making for the support of walking and sojourning.

Pedestrian needs and wants are generally defined on the individual level: what does a pedestrian need or want to have. These needs and wants need to be translated and up-scaled to the 'collective' stakeholders' frame of mind and span of control. In this study needs and wants are only relevant if they are socially and politically acceptable (cf. the category of public/political need as defined by Lapintie: see Section B.5.3 of the PQN Final Report). Methodology needs to include testing for these aspects.

Basically there are three routes to the identification of quality needs:

- a. by deduction
- b. inductively
- c. combined approach.

a. Deductive identification of needs.

In principle the use of models that are based on deductive reasoning can lead to comprehensive coverage. They are however not automatically valid and reliable and depending on the quality of the model. Models need to be validated and verified by empirical evidence. Maslow's hierarchy of needs and Lapintie's classification of needs are examples of models that used mainly deductive reasoning to arrive at a list of needs. Maslow's model, although plausible, quite popular and much used, produced a lot of discussion and was criticised and amended by many scientists. Lapintie's model, although based on insights from a variety of disciplines, is new and not yet reviewed by the scientific community outside the PQN project.

b. Inductive identification of needs

The inductive approach uses identification by empirical evidence. The inductive approach does not necessarily lead to comprehensive coverage, because it relies on expressed needs.

Bradshaws' taxonomy of needs shows that there are a number of methods to identify (reported) pedestrian quality needs. Basically the most 'logical' way to identify needs is to 'simply' ask pedestrians what their needs and wants are. This is not always possible, practical and does not always produce a true and comprehensive coverage of actual and future needs. Therefore alternative sources are needed:

- representatives of relevant groups
- guardians of vulnerable groups, that cannot speak for themselves
- conclusions from empirical and theoretical scientific research
- expert opinions and 'best professional judgement'
- signals from the public media

- complaint accounts (records of received complaints, compliments, reports of faulty infrastructure and facilities etc.)⁶
- accounts from various sources about countermeasures that people take to prevent misgivings (like keeping children at home or transporting them because of fear of road danger)
- accountings from other cities, regions, countries and continents
- future prospects and forecasting models.

When identified, the individual needs have to be classified, and that always involves some kind of deduction or modelling. The result depends on the quality of the survey and the questions asked.

In the context of the WALCYNG project Hakamies–Blomqvist & Jutila (1997) conducted an extensive literature survey on mobility related needs. Based on the results of that survey, Risser & Chaloupka (2009) state that when people, as non-motorised road users, assess their living conditions in relation to traffic preconditions ('the set scene') they consider, amongst others:

1. social values and motives (contacts, relationships, transaction)
2. health aspects, the provided comfort ('easy to walk')
3. comfort
4. weather protection (against rain, sun, snow, wind)
5. safety preconditions
6. mobility (meaning the given opportunities to be mobile spontaneously)
7. aesthetics
8. interoperability/usability.

c. Combined approach

A combination of the deductive and inductive approaches can compensate for the inherent limitations of them. The classification that Lapintie devised, offers a general comprehensively covering framework for classification of needs on the four discerned activity levels. Vukmirovic's classification of pedestrian groups can be used for the specifying general and group specific needs (Vukmirovic, 2010). The cells within the framework can be substantiated by information from various sources: literature, statistics, archives, the internet, dedicated surveys and 'best professional judgement'.

In a policy development process the relevance of identified needs and wants depends on the stakeholder's position, particularly what the stakeholder can offer to do to maintain, manage or improve quality for pedestrians. In this context it is important that a tailored methodology to assess quality needs is offered. A major distinction in methodology relates to the activity level that policy making is directed at.

As Steg & Vlek (2009) argue, needs are not fixed and static. In practise they will be influenced by societal developments as well as the subject's abilities and the opportunities offered. Assuming that in a given situation, opportunities offered can be seen as a constant,

⁶ Received complaints usually represent only the tip of an iceberg. For most people minor annoyances are not enough to take action towards the authorities. A problem needs to rise to unbearable levels. In most of the times complaints need to be 'translated' to functional deficits. When things are all right, people will not come to their feet to say so.

distinction can be made in general needs, that apply for all pedestrians and specific needs, which relate to the pedestrians' (group's) abilities.

Identified needs

The main aim of the identification of pedestrian needs is to provide a suitable and convincing ground for stipulating requirements for pedestrian facilities. There appears to be consensus that the most basic general needs of pedestrians are mobility, accessibility, safety and health.

There is however a great variety of pedestrians and, obviously, there is also a great variety in person specific needs. Thus it is not easy to provide a simple and universal picture of pedestrian needs. The question is then, which pedestrian would be the reference standard.

Assuming that policy making and planning targets at providing for the largest possible part of the population, it is most opportune to look at the Greatest Common Divisor and not so much at the Average Pedestrian. In the latter case only half of the population can be served; in the first case a grounds can be provided to serve 90% or more. Asmussen estimates that 30 – 40% of the population has relevant functional limitations. From a survey in the Netherlands it appears that for at least 6 – 9% the limitations are so severe that their mobility is hampered (Methorst, 2010-2).

It appears that basic characteristics and abilities set the stage for pedestrian needs:

- Heterogeneity: almost everyone is or can be a pedestrian
- The dimensions of a pedestrian: takes approximately 0,5 square meters of space, smaller than any vehicle; a pedestrian takes up somewhat more space when he or she uses walking aids or carries goods
- The walking average and maximum speed slower than (almost) all other modes
- The action radius of a pedestrian: less than other modes; the 'normal' action radius varies, depending on abilities, between 100 meters and 1,500 meters. However, like true for any mode: the actual action radius depends on the urgency of the need and the reward one gets for going.
- A pedestrian not only walks, but also sojourns in public space
- A pedestrian is relatively vulnerable.

The degree to which the pedestrian's needs are satisfied plays a role in their Quality of Life. Pedestrian needs are subjective and vary for ability, age, lifestyle, culture, climate and many more contextual factors. Not everyone has the same needs, and needs can vary over time as well. Some needs are quite explicit and other are somewhat or totally hidden. This great variety will not make it easy to develop an effective and efficient strategy for the support and improvement of walking and sojourning. There are however some basic principles, similarities and common features that gives us something to go on.

Needs in relation to walking and sojourning

Lapintie (2008, 2010) classified needs according to their scope for pedestrian existence. The most basic scope relates to human **existence**, survival and forgivingness of the environment when something goes wrong. Basic pedestrian needs are Mobility, Accessibility, Safety,

Health and Sustainability, which can also be worded as Conviviality, Convenience, Connectedness, Conspicuousness and Comfort (5C's; Gardner cs., 1996).

A somewhat wider scope refers to **psychological** needs to feel at ease, to belong, to be respected and autonomous, living a satisfying and meaningful life.

As next level scopes he distinguishes aesthetic needs, social needs and public/political needs. **Aesthetic** needs refer to the preference for well-designed and well kept products, which help to feel at ease and orientate. **Social** needs relate to the necessity of communication with other social groups, and cooperation and segregation. The widest scope constitutes **public/political** needs. These types of needs concern matters that people feel that they have a right to or behaviour that they are entitled to. Basic in this respect are freedom to use public space, mobility supported by adequate facilities, equal treatment and protection against threats. Public/political needs are to some extent codified in legislation and in guidelines, but can also be non-codified political statements or supported opinions in the media. The European Charter of Pedestrian's Rights and National traffic, transport and public space use legislation, give most foothold in this respect.

Lifestyle activity level

The same basic needs can have different appearances on the four optional activity levels: lifestyle, strategic, tactical and operational activity levels. At the lifestyle activity level preconditions for walking and sojourning are created and pedestrian needs roughly equal human mobility needs. One's lifestyle relates to where one resides, education, employment and income, competences etc. Information, proximity of relevant destinations and the 5 C's of geographical conditions and the network for walking, to feel at home, independence, social activities, free use of public space and equity are the dominant pedestrian needs.

Strategic activity level

The Strategic activity level concerns decisions on where and when to travel and sojourn, modal choice, together or alone. On the strategic activity the same needs apply, but they are more concretely directed at temporary conditions. There is a difference in needs between daily trips and new and incidental trips to unfamiliar grounds. For the latter certainty about conditions under way is a relevant need. Aesthetics play a role in choices.

Tactical activity level

Needs on the tactical activity level concern do-ability of route choices, orientation, concentration on the walking task etc. and do not differ much from needs on the strategic activity level. Conspicuousness is more important than at the strategic activity level.

Operational activity level

Operational activity level needs touch dealing with concrete situations. The 5 C's again are dominant general needs. Apart from that skills to cope with the actual conditions matter most. Forgivingness of conditions is a crucial need, particularly in complex and dangerous situations. Convenience bears upon functionality, feasibility and suitability of situations for the task performance in specific circumstances. Free and unobstructed use of public space, shielding from motorised traffic, adequate walking facilities and security are especially important needs for vulnerable groups like children, women at night, the elderly and disabled

persons. The two most expressed pedestrian needs are: dedicated pedestrian space and safe street crossing facilities.

Indicators for existing pedestrian needs

With regard to the identification of needs indicators can help to pinpoint the actual situation for policy making on pedestrian qualities. The most important issue is to know the client: what groups are there and what features set the scene for their needs. A second question is at what activity level is to be policy directed.

With regard to knowledge about the target population, its size and composition are important. Basic indicators in this respect are:

- Number of inhabitants per age group (children, adults, elderly, gender)
- Number of visitors that walk in the area
- (Estimated) number of disabled persons, specified to handicap.
- Number of one-person households
- Distribution of household incomes
- Vehicle ownership
- Mobility (travel motives , number of trips on foot, distances covered, time in traffic)
- Culture regarding walking (public opinion, media statements)
- Group shares

Important features that set the scene for pedestrian needs:

- Climate
- Natural landscape features (share of flat terrain)
- Land use characteristics (attraction points)
- Transportation characteristics (Public Transport availability and accessibility)
- Number
- Time spent sojourning in public space
- Number of casualties, including falls
- Current governmental policies.

Conclusions

1. Needs, abilities and opportunities are interdependent.
2. The Design for All principle is a leading principle.
3. Quality needs related to tailored solutions. The actual quality needs depend on pedestrians present, expected or wanted in the jurisdiction.
4. Activity levels are nested and interdependent.
5. General pedestrian quality needs are de 5 C's, proximity of destinations, free choices, forgivingness of conditions underway.
6. If one asks a pedestrian: dedicated space and crossing facilities are on the top of their list.

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