THE GOOD STREET:

A NEW APPROACH FOR REBALANCING PLACE AND MOBILITY

anwb

AWARENESS

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FOREWORD

Our cities are getting busier and busier. It is becoming increasingly difficult to keep them easily accessible and pleasant places to live, work and simply spend time. Fortunately, at the same time more people are taking up cycling as a mode of transportation. This leads to a new challenge: cycle paths that are getting busier and busier. In recent years, there has been not only an increase in traditional bicycles, but also many new types of cycles, and other small mobility devices. These are often faster or larger than more traditional bicycles; e-bikes and speed pedelecs, large cargo bikes, and an array of scooters. The result: congestion, frustration, and unsafe environments.

The Royal Dutch Touring Club, known as ANWB, representing the interests of all 'mobilists', together with mobility experts, has devised a more balanced approach to design cities in such a way that anyone participating in the transport system has enough space, where traffic becomes safer and the city environment is calmer and more pleasant. We call this design method 'The Good Street'. Known in Dutch as 'Verkeer in de Stad', this methodology was first introduced in 2016, and has since been further developed, commissioned by the ANWB and in collaboration with the consultant team consisting of Mobycon, Awareness, Ben Immers Advies and Bart Egeter Advies.

The Good Street is an approach that examines the desires and principles for spatial quality and traffic networks in a coherent fashion: first through desired place and transportation structures at urban, district and neighbourhood levels, and then in principles for the allocation of space and concrete designs for streets, public spaces and major roadways. As part of the methodology, a visual design tool is also recommended (Streetsketch), making the consequences of design choices immediately visible in the cross-section of a street. Using this approach, different scenarios can be easily compared in order to determine the ideal design choice for the spatial distribution of the public realm.

After the introduction of the first edition, the methodology was applied by ANWB and partners in four major Dutch cities on a pilot basis: The Hague, Tilburg, Rotterdam and Amsterdam. In Groningen, the municipality worked independently with the methodology, resulting in the first street design that was devised using this methodology and then implemented. Through these pilots the methodology has been tested, adapted and improved. It aligns with and supports initiatives such as Sustainable Safety III and the Dutch Strategic Plan for Traffic Safety.

The Good Street is broadly applicable within the built-up area and has been designed so that municipalities can apply the method independently. However, Mobycon, Awareness and Bart Egeter Advies are available as content and process facilitators in its application. In addition, they provide masterclasses and presentations on The Good Street. You can contact Paul Weststrate of Awareness, Johan Diepens of Mobycon or Bart Egeter of Bart Egeter Advies.

For a concise summary of the methodology, read Chapter 2: "Principles and characteristics of The Good Street"

1. INTRODUCTION: A DESIGN METHODOLOGY FOR URBAN TRANSPORTATION

In recent years, attention placed on the design of urban public space has increased considerably due to all kinds of developments, prompting the creation of The Good Street. Over time, these trends have only intensified, all the while interacting with each other. As a result, there is an increased need to examine the layout of our streets in a fundamentally different way. We describe a number of these trends and developments in cities below.

TRENDS

The city streetscape is changing as we see an increasing amount of traffic in the city. There are a number of issues simultaneously at play, leading to higher levels of congestion and concerns about road safety. We see the following developments:

The popularity and growth of cities is leading to a move towards densification. Cities are getting busier as a result. This offers opportunities, but can also affect accessibility and quality of life.

- This creates more ***pressure on the public space***. The mobility of an increasing number of city dwellers per square kilometre cannot be served according to the traditional modal split: the proportion of space dedicated to the car will have to be reduced in favour of other modes of transport that take up less space (both while moving and stationary). In this trend there is clearly an ***ever-increasing use of bicycles***. This is a positive development, but as more people cycle, the space available to cyclists – cycle tracks, bicycle lanes or simply on the street – becomes crowded, causing an increase in ***(potential) conflicts between cyclists and pedestrians***. Sometimes there is simply not enough space available to sustain the growth of bicycle traffic in all its manifestations.

- We are also seeing an i***ncreasing diversity of (new) vehicles*** about which there is a lack of clarity about the position of these vehicles on the road or on bicycle infrastructure. There is also a greater variation in the size and speed of vehicles. Think of the cargo bike, e-bike, speed pedelec (fast e-bike), e-scooter, moped, 'Stint', 'Biro', 'Segway' and other forms of micromobility.

- Unfortunately, we also see an increasing number of traffic injuries and fatalities, including many cyclists. This poses new challenges in the field of road safety. The Dutch Strategic Plan for Traffic Safety (SPV) has set a goal to substantially reduce the number of injuries and fatalities by 2030. The increase in the number of people seriously injured is explained in part by an increase in single vehicle crashes, **A**.

Transition to sustainable and active mobility

Increased focus and funding for sustainable mobility is becoming the norm as governments and the private sector have committed themselves to the transition from fossil fuels to carbon neutral or zero carbon. The transition is also desirable for other emissions, including NOx and particulate matter, that negatively affect health and air quality. This increases the need for a transition in urban areas to modalities that allow for space-efficiency and are already emission-free or low-emission.

The time of building our cities first for cars, then for public transport, followed by bicycles, and leaving the rest of the space for pedestrians is over. The pyramid of modal priorities has clearly flipped.

As a result of transitions in mobility choices and urbanization, the urban distribution of goods is also changing. There is a shift from large trucks to more compact cars and cargo bikes. Large courier companies are seeing the benefits of cargo-bike based distribution systems in more and more cities.

In relation to these trends we see the following developments:

- Linked in part to the increasing popularity of our cities and the growing pressure on public space, we see a growing ***trend toward creating more room for quality public space, pedestrians, cyclists and public transport***. In addition, we see increasingly ambitious plans to stimulate cycling and walking. We see ***related initiatives and routes*** that are more or less in line with ideas from Verkeer in de Stad (The Good Street) and this is also reflected in the mobility visions of large cities. Of course, ***connectedness and reachability*** of our cities is still important, but ***traffic safety, sustainability and quality of life*** are becoming increasingly important.

figure 1.1: *It's all about choices and priorities. Here, the sidewalk has been taken over by parked bicycles.*

- In addition to healthy eating, we also increasingly recognize the importance of regular exercise, especially as we spend more time doing sedentary activities. Walking and cycling have the potential to give an enormous boost to creating ***healthier*** cities.

- In cities we are seeing a tendency to lowering or abolishing ***parking standards*** and replace minimum requirements with maximum ones. This is due, in part, to the awareness of the decline in the popularity of car ownership (following policy), and because the car is becoming less desirable (steering policy).

- ***Urban logistics*** is becoming (and must become) smarter: transitioning from large trucks with higher emissions to more small-scale, cleaner distribution means.

The need to adapt public space–for which The Good Street provides a contemporary methodology–may also arise from other current challenges for cities around ***climate change, water management, heat stress and health***. Using a win-win approach, many cities are trying to cleverly combine these tasks.

BALANCING SPACE IN THE CITY

The city belongs to everyone yet it is impossible to satisfy everyone when it comes to the quality of public space, quality of life and the level of accessibility for all modes. This requires choices in the distribution–and perhaps most importantly–in the design of the public space.

There is not only tension between space for movement (as in moving traffic) and place, but also increasingly between vehicle parking and accommodations for walking. Due to the growing number of vehicles that are parked on the sidewalk, and competing on demand for space, the public realm can become cluttered. At the same time, a healthy mix of functions and some 'friction' is also what gives a city its character. To a certain extent, mixing functions and hustle and bustle can also contribute to spatial quality and one's experience of the street.

A choice for a balanced layout of public space can have an impact on how we want to move around and where we want to live, work and play. With more attention placed on active mobility (healthy, sustainable, clean),

Figure 1.2: *Public space is more than space for traffic.*

liveability and safety, the relationship between buildings and the public space requires more consideration.

As a design method, The Good Street offers a solution that is in line with these trends. It represents a structured way of thinking about the design of urban public space and the choices to be made within it. From the network level down to the local design level of a street.

THE GOOD STREET IN A NUTSHELL

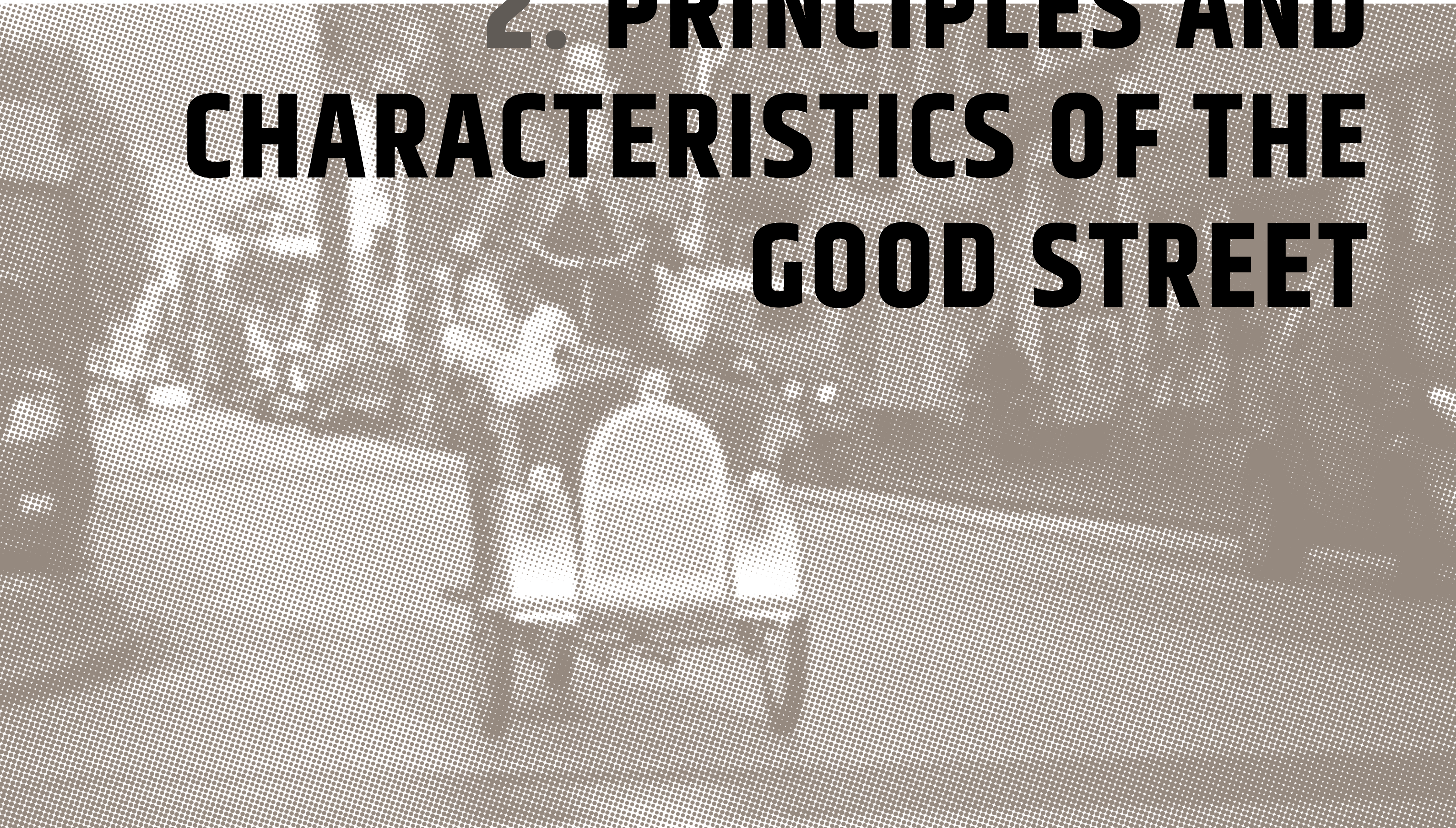
In The Good Street design methodology, we provide a new way of thinking, with new foundations for design. The Good Street is a method in which you first map out your foundational principles by means of ***desired spatial quality*** and afterwards you decide on the ***desired traffic flow***, at the network level. We work with ***vehicle families***, defined by classifying comparable vehicles into a 'family' based on mass. Then, using the vehicle's achievable speed, families are further subdivided into ***vehicle types***. The ***'achievable speed'*** is the speed that a vehicle can normally reach, i.e. without excessive effort on the part of the driver or (illegal) acceleration of the vehicle.

Balancing spatial quality and traffic functions on the basis of networks for all vehicle families leads to a more balanced structure of urban public space. This is recorded on a map with so-called ***urban traffic environments***. An urban traffic environment is a street (or area with streets) where a certain speed limit applies, possibly with special requirements from spatial quality or traffic networks. These urban traffic environments form a guiding framework for the further layout and the actual design.

You can translate the structure within the urban traffic environments into designs at the ***location level.*** It is then a matter of considering how to design the space concretely, determining whether or not to make use of different domains in which vehicle types share space with each other or not. For this purpose, classification principles have been developed, which indicate how you can provide local tailor-made solutions. The design at the location level is always tested against the main decisions previously made at the network level.

In the next chapter we will present the essential principles and characteristics of The Good Street.

2. PRINCIPLES AND CHARACTERISTICS OF THE GOOD STREET



GENERAL PRINCIPLES

The methodology revolves around the design of public space. The Good Street is a design method on different levels where the wishes of the users form part of the assessment framework. A good integrated balance between traffic safety, quality of life and accessibility is paramount.

Traffic safety

An important starting point is traffic safety in an urban setting. In this design methodology, a safe and forgiving design are crucial. Through this, safe use of the space can be guaranteed for all users. In addition, based on the fact that injury is caused by a difference in mass and achievable speeds of vehicles, these factors are used as important criteria for making choices between mixing or separating different types of traffic.

Liveability

A liveable city is an important next step, where a liveable city is one in which it is pleasant to live and work and in which mobility is not the expense of staying in place. Essentially, you don't want too many vehicles moving through places where people live or play, high speeds or unsafe environments should not exist near schools, and people need to be able to safely cross busy roads. The living environment and the layout of the public space should invite you to walk and cycle.

Connectedness

The Good Street approach is not a plea to sacrifice the connectedness of cities for the sake of ultimate liveability. There are important economic and social interests in having well-connected cities. Within The Good Street approach, for example, we encourage the creation of fully-fledged networks for all vehicle families, including pedestrians and light motor vehicles, which also makes the use of these modes of transport more attractive. At the same time, we evaluate how to translate connectedness into the different types of traffic and how we achieve the right balance between traffic and spatial quality. Connectivity is important but should be respecting of surrounding land use and character of the place.

Coherent (Integrated) design:

A street–containing space for cars, bicycles, and pedestrians–is more than just a space for traffic. Public space fulfils several functions in our cities:

- Public space is the place where we physically meet outside the intimate circles of our homes and workplaces. Even if we don't have plans to meet with someone, we meet other people there, and experience public life.
- Together with the buildings, public space gives a city its identity.
- Public space enables access to the city. Apart from entering underground garages, our journeys always begin and end with walking.
- Public space provides space for greenery, nature, and water management.

A good design is based on a good cohesive, integrated consideration of all functions.

PRINCIPLE 1: THE SPEED LIMIT DEPENDS ON THE DESIGN OF THE PUBLIC SPACE

Under current conditions, speed limits are often linked to the type of vehicle, e.g. 25 km/h for a moped or electric bicycle. Because different vehicle types often use the same public space, different speed limits sometimes apply to the same public space (or part of it). An electric cargo bike, racing bike, moped and children's bike often share the same space and the same is true for trucks and speed pedelecs. The resulting differences in speed, combined with sometimes large differences in mass, can cause serious injury in collisions.

Using The Good Street approach, we make the speed limit dependent on the location of a road user in space, rather than the type of vehicle. In practice, this is already regulated for cars, but not consistently for other vehicles.

By allowing the design of public space to determine the speed limit, we create a calmer and safer environment (with fewer differences in speed) and more clarity about what is and is not allowed. The speed limit is determined and enforced first by good and 'logical' design of the public space, second through legislation and only in the last instance by actual enforcement. What is a logical design? It is a design that, by its nature, enforces the right expectations and behaviour from the users of that space. By applying design interventions, it must 'feel' logical where you may or may not travel and how fast you can do so.

Using The Good Street approach, all vehicles that are allowed to use certain parts of public space are subject to the same speed limit. Where, for example, a speed limit of 20 km/h is applied, a cyclist - even if they are on a speed pedelec – can also only travel at a maximum speed of 20 km/h. Essentially, this reflects a principle common to cars to other vehicles: although a car can technically drive 180 km/h, it is only welcome in urban public space as long as it does not exceed the applied speed limits.

PRINCIPLE 2: VEHICLE FAMILIES - THE CLASSIFICATION OF VEHICLES (FIRST) BY MASS AND (SECOND) BY ATTAINABLE SPEED.

In current conditions, legislation not only applies to the speed limit for each type of vehicle, but also to its location on the road. This does not always lead to logical and desirable scenarios (think again of the speed pedelec on the arterial road or the cargo bike on a narrow bicycle path).

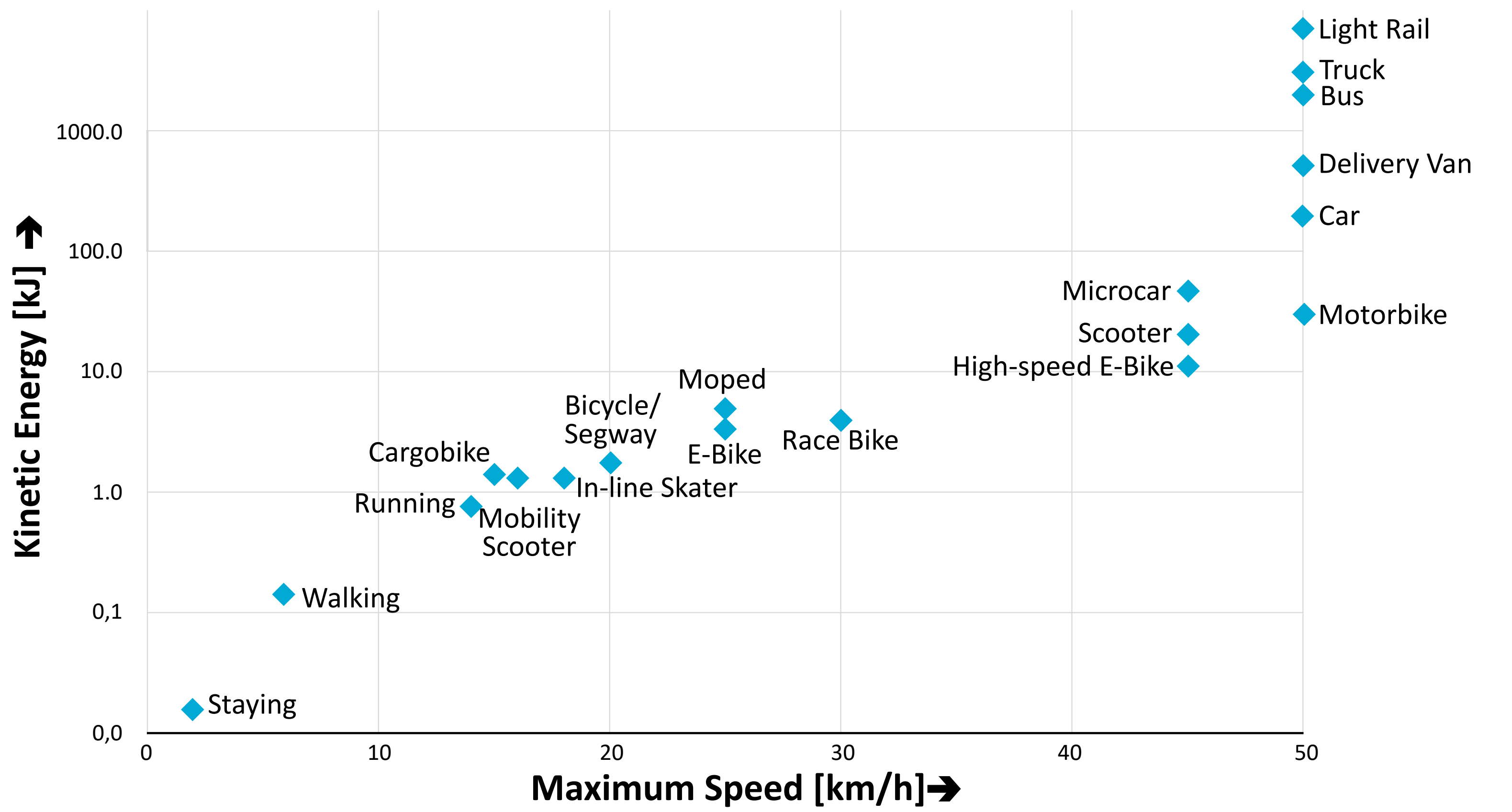
In the case of The Good Street approach, the primary step in determining the logical space for a vehicle is by considering its mass, with the evaluation of a vehicle's achievable speed as a secondary step. By 'achievable speed' we mean: the speed that a vehicle can normally reach, i.e. without excessive effort on the part of the rider or (illegal) acceleration of the vehicle. In addition to regulating the speed ('enforced' by public space), this also reduces differences in mass, which leads to greater safety. This is due to the concept of kinetic energy.

Kinetic energy

Traffic safety is a fundamental condition in the design of public space. It is mainly related to the kinetic energy of vehicles: the greater the kinetic energy, the greater the consequences of a collision. The kinetic energy is determined by the formula: E = ½ mv2

Where E stands for energy, m for mass and v for speed. Both quantities have a central role in the design approach: the maximum speed is linked to physical elements of the public space, and the mass of the vehicle, determining (in combination with its speed) whether it is allowed or not.

Figure 2.0: *Kinetic energy is a function of both the mass and the attainable speed of a vehicle*



Mass and vehicle families

In The Good Street, all vehicles are classified into vehicle families: a collection of vehicles of similar mass. The maximum mass of successive vehicle families increases by a factor of 10. Each vehicle family is defined by a maximum mass (unladen weight). All existing - and also future, still to be developed - vehicle types should be assigned to one of the six vehicle families according to their mass, as shown in Table 2.1. The limits are not absolute: there is still discussion as to where exactly certain limits should lie. We therefore use the 'approximate' sign (~) throughout the report to indicate weight classes.

Figure 2.1: *Vehicle families defined by maximum mass.*

Vehicle families	Description	Vehicle mass (unladen weight)
A	walking	No vehicle
B	"Bicycle"	~35 kg
C	"Light motor vehicle"	~350 kg
D	"Car"	~3500 kg
E	"Truck"	~3500 kg
F	rail	Guided vehicle

Feasible speeds and vehicle types

We not only want to keep the differences in vehicle masses within families as small as possible, but also the variation in their achievable speeds. In order to mix safely, the achievable speeds between vehicles should differ as little as possible.

There are large differences in attainable speeds. Particularly within the B and C families:

- B: "Bicycle" (< ~ 35 kg)
  - Traditional bicycles (up to ~20 km/h)
  - e-bikes (up to ~25 km/h)
  - Speed pedelec and road bikes (up to ~45 km/h in the city)
- C: "LMV" (~35 - ~ 350 kg)
  - Rickshaws and cargo bikes (up to ~20 km/h). Due to their weight, non-motorized heavy cargo bikes also belong to this category
  - Mobility scooters have a limiting speed. Many are limited to 12-17 km/h. There are also versions that are limited to 25 km/h
  - Mopeds, mini-bikes, e-bikes, and large cargo bikes (e-bikes for logistics) limited to 25 km/h
  - Scooters and covered mobility scooters (such as the 'Canta' or Birò) limited to 45km/h
  - Motor scooter and motorbikes (with an achievable speed of 70 km/h and higher)

Therefore, within each vehicle family a further distinction is made between vehicle types based on achievable speed, see ***figure 2.2***. A vehicle type is a collection of vehicles, belonging to the same vehicle family, with a comparable attainable speed (within a range of 10km/h).

A vehicle type is designated by combining the letter of the vehicle family with the upper limit of the attainable speed range. The vehicle type B20 comprises the 'bicycle-like' means of transport, with a weight of up to approx. 35 kg and a feasible speed between approx. 10 and 20 km/h, i.e. the bicycle, the scooter and a hoverboard.

The physical appearance may therefore differ within a vehicle type (e.g. a bicycle and a scooter). Two similar vehicles may also belong to different vehicle types (e.g. a normal bicycle and a speed pedelec).

The list in ***Figure 2.2*** is not exhaustive and some empty compartments could be filled with new vehicles in the future.

Normally, a vehicle cannot drive faster than its achievable speed. A vehicle can however, drive slower: a racing bike can also travel at 20 km/h or come to a standstill. Do note that all vehicle families (with the exception of A: walking) are represented in all speed categories within the city (from 0 to 50 km/h), but that within the lighter vehicle families (A, B and C) there are representatives that do not exceed a certain achievable speed, such as the traditional bicycle.

__Figure 2.2__: Further breakdown of vehicle families by vehicle type on the basis of achievable speeds, with examples of vehicles falling within each.

Vehicle Family	OPERATING SPEED					
	0-10 km/h	**10-20** km/h	**20-30** km/h	**30-40** km/h	**40-50** km/h	**>50** km/h
A “Pedestrians”	**A10** walking	**A20** jogging				
B “Bicycles” < ~ 35 kg		**B20** bicycle, scooter, hoverboard, e-skates	**B30** e-bike, e-scooter, monowheel	**B40** speed pedelec, race-bicycle		
C “LMV” < ~ 350 kg		**C20** cargo bike, bicycle “bus”, Segway	**C30** e-cargo bike, mobility scooter, micro-car light		**C50** moped, micro-car, small NEV	**C50+** motorcycle, motorscooter
D “Cars” < ~ 3500 kg					**D50** large NEV	**D50+** car, delivery van
E “Trucks” > ~ 3500 kg						**E50+** truck, lorries, bus
F Rail vehicles						**F50+** tram, light rail

The division into vehicle families and vehicle types proposed by The Good Street forms an important basis for the design of public space. Later in this document, we will address questions of mixing or separating and the distribution of space on the road, as they are directly linked to vehicle types and families. Using the design principles of The Good Street is certainly possible within existing laws and regulations. Moreover, the division into vehicle families and vehicle types has the advantage that every newly developed vehicle has a place within this division based on its mass and achievable speed.

PRINCIPLE 3: BALANCE BETWEEN THE SPACE AND THE TRAFFIC SYSTEM

Every inhabitant or visitor of a city makes use of public space in two ways: to stay put, and to be in motion, or to participate in “traffic”. This notion forms the basis of The Good Street design approach. In every design step there must be a balance between 'spatial quality' in the broad sense of the word and an appropriately functioning traffic system. In The Good Street, 'spatial quality' means not only the quality of a place to stay, but also space available for all other urban functions that are not traffic related.

In practice, we often see that 'space' and 'traffic' area-based or urban structures are developed, but only come together when the specific designs are made at the location level. The risk here is that incompatible elements are realised only after the installation or application. For example, it is very difficult, or impossible to build a well-functioning shopping street that also caters for the desired 20.000 vehicles per day. This leads to unsafe, or unattractive design outcomes, hurting either the local land use or leads to unwanted congestion on the street network.


Source: Robert Oosterbroek

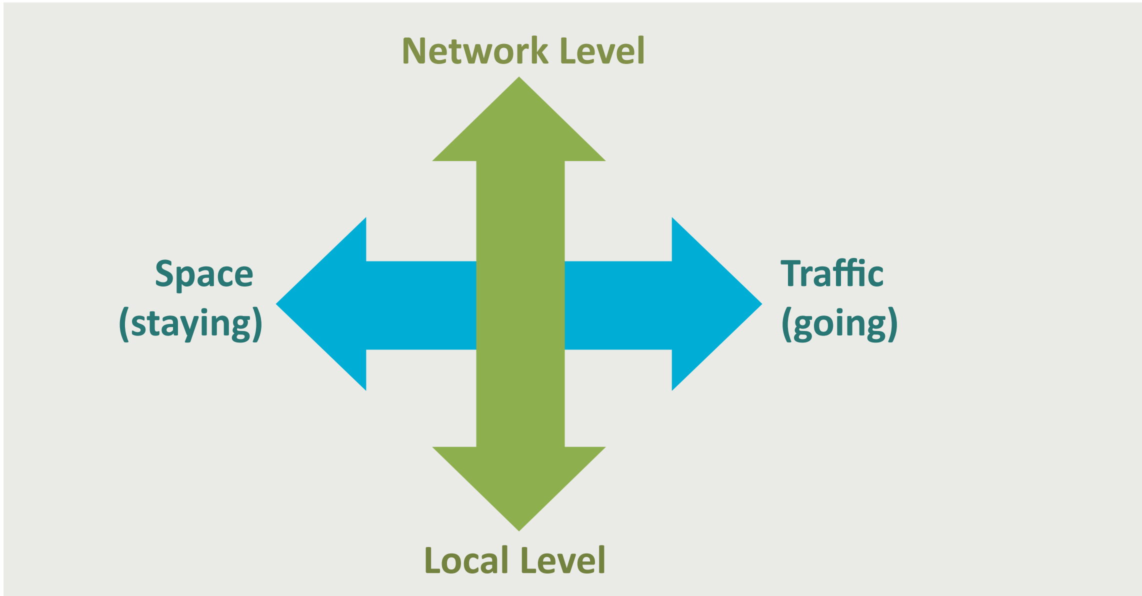


***Figure 2.3**: The design approach is founded upon the search for a balance between the two design levels (structural and local) and the functions and qualities of the public space (spatial quality versus traffic quality).*

As a result, we distinguish between two levels of design:

1. The **network level:** at this level you determine first which spatial qualities are important and second which traffic networks (per vehicle family) should be accommodated for each street, space, or area. This involves considerations at a functional level: which vehicles are allowed, and which speeds are desired. Where qualities are mutually exclusive, an assessment will have to be made. This will ultimately lead to the designation of desired urban traffic environments.

2. The **local level**: here a specific design is made for each street, road or square in which a balance is sought between the spatial and traffic qualities. These will have been determined at the network level and consideration should be made as to what that means for the division of that space into different domains. This also requires determining which vehicle types we can mix and which we must separate.

Figure 2.4: *Overview of the design methodology.*

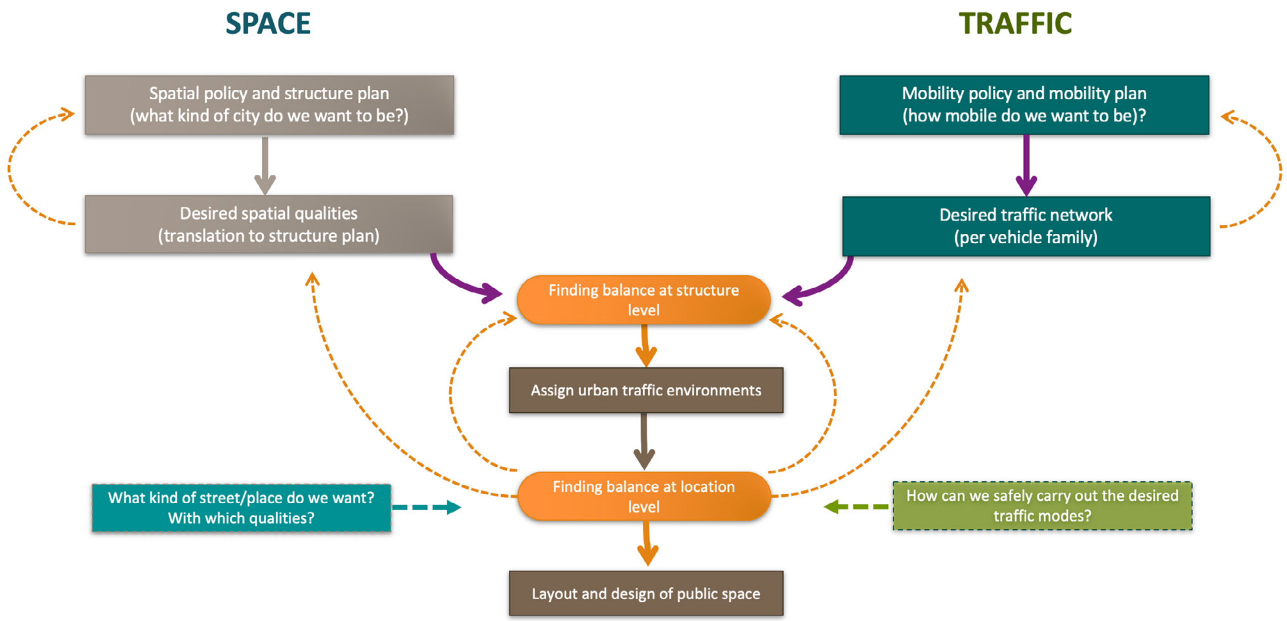


Figure 2.4 gives an overview of the total design methodology. It shows both the distinction between space and traffic and the distinction between network and local level. At first sight, the diagram may suggest a top-down approach: from desired structures for space and traffic, via integration at the network level, to elaboration at the local level. The arrows also indicate the very important bottom-up feedback loops. Findings at a more concrete 'lower' level can lead to adjustments at a more abstract 'higher' level. This means that, in principle, the methodology can also be applied bottom-up.

PRINCIPLE 4: START WITH SPATIAL QUALITY

Traffic and mobility play an important role in the life of the city, but it is not the most important thing to facilitate in a city. Transportation is a means to an end for getting from **A** to **B**. This design method intentionally starts by determining what the spatial qualities of all A's and B's should be, the places where we stay or carry out activities. In other words: what spatial quality do we want for streets and areas in our city? This includes desired functions, values, physical qualities, etc. There is no blueprint on how this should be done, but the aim is to identify a number of clear qualities against which we can weigh up traffic principles of networks and accessibility. We will discuss this in more detail in chapter 3.

PRINCIPLE 5: EVERY VEHICLE FAMILY DESERVES ITS OWN (FUNCTIONAL) TRAFFIC NETWORK IN THE CITY

The classic car-bike-pedestrian layout has become obsolete, in part due to the arrival of new types of vehicles. With the recognition of different vehicle families, it is important to develop networks for each of these vehicle families that allows one to get from A to B quickly and safely. For each vehicle family, we look at two things: On the one hand at the main **networks** with their associated characteristics (such as desired speeds), and on the other hand at a finer, close-knit scale.

Functional networks of different vehicle families can partly overlap. If main networks overlap in one place, it is important to set priorities and make choices at the network and local levels. The available space and policy-based principles in all kinds of areas play a role in the assessment. It is also not the case that every vehicle family necessarily has its own continuous physical network. There is simply not enough space. This will be discussed in more detail in chapter 3.

PRINCIPLE 6: NETWORK LEVEL - THE COMBINATION OF NETWORKS AND DESIRED SPATIAL QUALITIES DEFINING URBAN TRAFFIC ENVIRONMENTS

At the network level, an assessment must be made as to which vehicle family should be 'dominant' in that section of public space and what the speed limit should be. This consideration is one between traffic networks, but also between traffic itself and the spatial qualities that are desirable in an area or street.

This determines what kind of **urban traffic environment** we link to a particular public space. An urban traffic environment is a street (or area with streets) where a certain speed limit applies, and possible spatial quality or traffic networks requirements. This results in further design principles for establishing the actual design of the public space, including the space for traffic. A test must then be carried out to determine whether a particular space can actually cope with this in terms of the physically available space and policy. We discuss this in more detail in Chapter 3.

PRINCIPLE 7: LOCATION LEVEL-DIVIDING THE URBAN TRAFFIC ENVIRONMENT INTO DOMAINS

At the local level we investigate the ideal layout of the public space in order to achieve the desired balance between space and traffic (the urban traffic environment). To this end, the public space is divided into one or more ***domains***, each with a **maximum speed** limit and a corresponding **normative vehicle family** (based on maximum mass). By normative vehicle family we mean the vehicle family that is the design vehicle in the spatial design. The speed limit allowed for this family also applies to all other vehicle families allowed within that domain.

We also draw up **general rules for mixing and separating** that describe which vehicle types are contained in which domain. In these general rules, the first priority is to minimise differences of mass and speed differences within a domain. In this way, a number of classification principles arise for each urban traffic environment. Public space can be subdivided into domains in such a way that traffic (all types of vehicles allowed in a given urban traffic environment) can be handled safely. Which classification principle is applied depends on the local situation, including the available physical space.

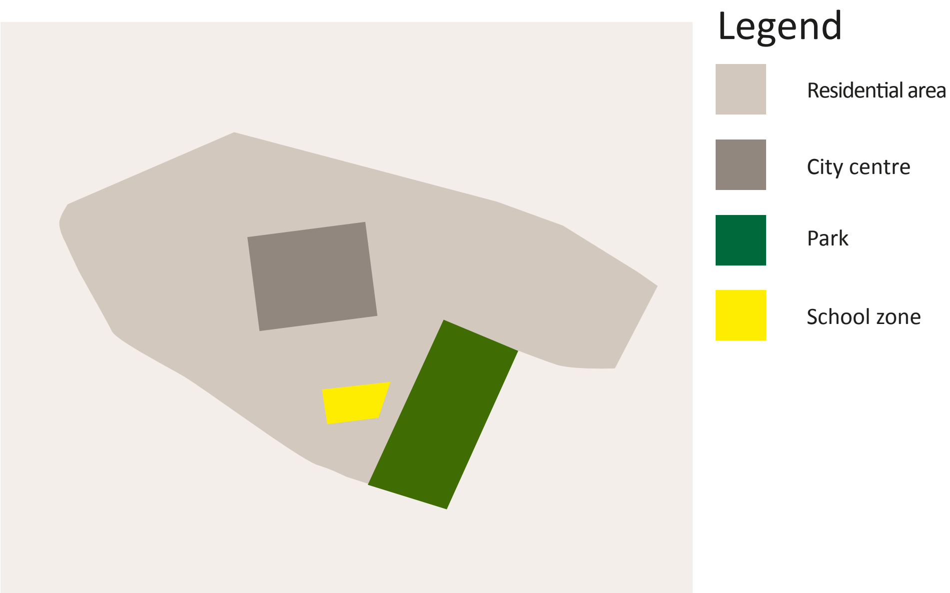


Figure 2.5*: Schematic example of a spatial analysis of a city and areas.*

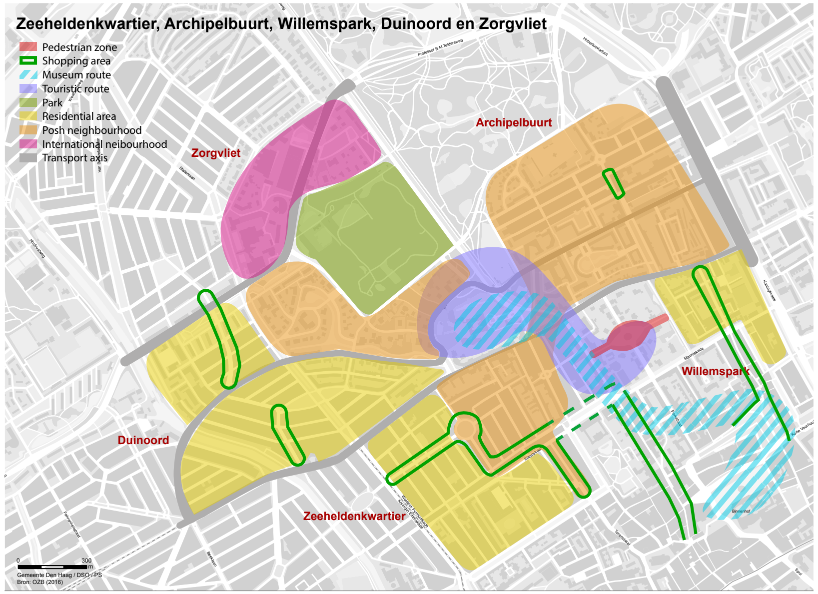


Figure 2.7*: Zonal layout with defined spatial identities (example from a pilot project in The Hague).*

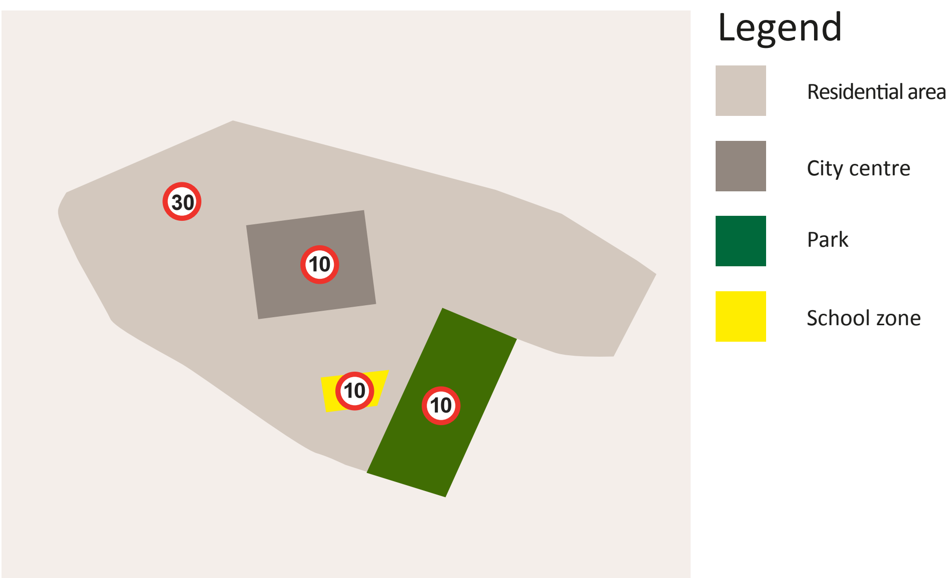


Figure 2.6*: The desired zonal layout with respective design speeds*

Figure 2.8: *Desired traffic networks per vehicle family*

Urban traffic environment and associated speed regime

Spatial qualities and possible specializations

Pedestrian area with emphasis on staying Variations (example): • *10-"park" (fits with values such as peace and quiet, nature)* • *10-"shopping area" (fits values such as dynamic, shopping street, metropolitan etc.)*	Zone for slow traffic that usually mixes well with staying Variations (example): • *20-"park" (fits with values such as peace and quiet, nature)* • *20 "Cycle route" (fits values such as dynamic/lively. May score lower on ability to cross or safe play space)*	Mixed urban zones Here is a lot of variation, for example: • *30 "residential street" (fits with living, quiet, crossable)* • *30-"bicycle and LMV path" (fits with through flow, busy, less able to combine with ability to cross or rest)* • *30 "urban street" (fits with liveliness, dynamic)*	Verkeersfunctie dominant • *Traffic function dominant* • *Should not be combined with school zone or center*

Traffic functions and possible specializations

Vehicle family: **A** - Pedestrians Impossible or limited combination with main networks of families **B** and above. Possible to vary depending on maximum desired intensities etc. The more traffic, the less this can be combined with values such as quietness.	Vehicle family: **B** - Bicycle type Impossible or limited combination with main networks of families C and above, but can compatible with **A**. Can be a main route with high intensities for family **B**, but it's not required.	Vehicle family: **C** - Light motor vehicles Impossible or limited combination with main networks of families D and above, but combinable with **A** and **B**. "LMV path" or "residential street". Variations also possible with a combination of 30 km/h and normative family **D**.	Vehicle family: **D** - Car-like or **E** - Freight-like **D**: Impossible or very limited possibility to combine with main networks of families E and above, but can be combined with **A**, **B**, **C**. **E**: main routes for (large) freight traffic or buses.

3. DESIGNING PUBLIC SPACE: DOMAINS, PRINCIPLES AND CUSTOMIZATION

DOMAINS AND CLASSIFICATION PRINCIPLES

A central concept in the assessment at the local level is the term ***'domain':***

*A physically separate part of the public space within which a **speed limit** applies to all vehicles and vehicle types. Its design is based on a **normative vehicle family** and a design speed corresponding with the applied speed limit in that domain.*

A street may consist of a single domain (e.g. a pedestrian area or a pathway through the park or natural areas), two domains (e.g. a residential street with sidewalks), or three domains (e.g. a main route for cars with separate cycle paths and sidewalks). Technically, a division into four or more domains is also possible (e.g. when there is a tram present).

None of the domains can have speed limit higher than that of the speed limit of the urban traffic environment that has been set (at the network level) for that street as a whole. However, there may be domains with a lower speed limit in that street. Each domain is designed with a normative (design) vehicle family in mind.

A domain is identified by the following elements: a number for the speed limit, followed by a dash and the normative vehicle family. For example: the domain **20-B** has a maximum speed of 20 km/h and is designed with the bicycle family as the design vehicle. In normal terminology, we generally would call this a bicycle path. It is important to note that this does not mean that no other vehicle families are allowed besides bicycles – this will be specified later in this document.

Another example is **50-D**. In common parlance we call this an arterial or distributor road carriageway, where you are allowed to drive 50 km/h and which is designed with the car as the normative vehicle family. Often it is part of a main route in the car network. This domain is also not exclusively reserved for cars; which vehicles are allowed or have to use it, we will examine later on.

In addition to domains for driving traffic, we also have domains that are not intended for traffic at all. Think of green areas, places to park vehicles, terraces, etcetera. For the sake of convenience, we have summarised these domains under the term 'parking and accommodation', which we give the symbol 'Ø'.

Each vehicle type (see ***figure 2.2, page 17***) is allocated to one domain, provided of course that that vehicle type is permitted in the urban traffic environment in question. However, under conditions to be discussed later, several vehicle types may be mixed in the same domain. Determining the domains into which a street is subdivided thus simultaneously answers the question of which vehicle types are mixed and which are physically separated. 'Physically separated' means a separation in the form of a physical barrier, or in the case of lower speed limits, possibly a visual, tactile or psychological barrier.

Each street (or more generally: public space) will therefore consist of one or more domains. A combination of domains in a street is called a **classification principle:**

The way public space is subdivided into domains in a given urban traffic environment so that all vehicle types (permitted in the urban traffic environment in question) can be safely operated.

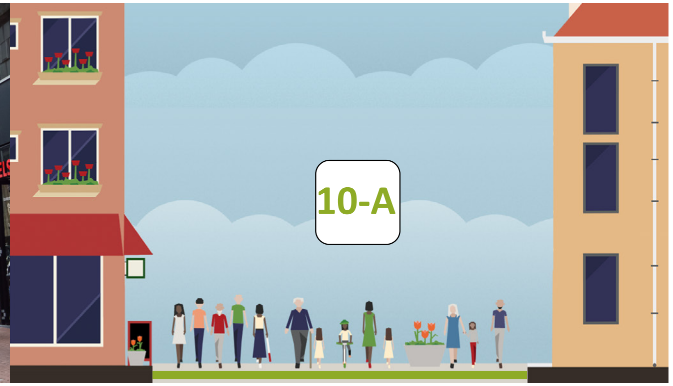
Which classification principle is applied depends on the urban traffic environment allocated to the street. It can also respond to additional requirements ('differentiations') from a spatial quality perspective, and/or the traffic function at the local situation. It can furthermore be tweaked to ensure it fits the available space.

Common classification principles

In theory, there is an endless number of possibilities to combine domains into classification principles. In practice however, there is a limited number of logical and common combinations of domains. Four common (traditional) classification principles are:

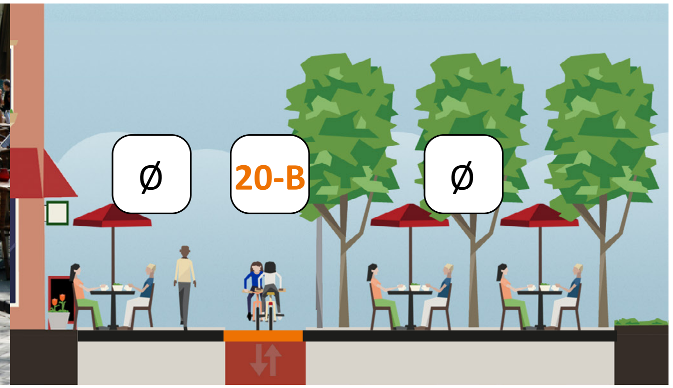
Classification principle {10-A}

A '**pedestrian area**' (urban traffic environment 10 km/h), consisting of one domain: 10-A (speed limit 10 km/h, pedestrians are the norm). Deliveries might be allowed during specific hours of the day, but should never exceed the speed limit of 10 km/h.



Classification principle {20-B}

A '**20 km/h stree**t' (urban traffic environment 20 km/h), consisting of one domain: 20-B (maximum speed 20 km/h, cyclists are the norm). Pedestrians can be mixed or separated depending on the local context and numbers of users.



Classification principle {30-C;10-A}

A '**30 km/h street**' (urban traffic environment 30 km/h). This is a traditional Dutch residential street, consisting of two domains:

- **30-C,** the 'roadway' (maximum speed limit 30 km/h, light motor vehicles are the design vehicle)
- **10-A,** the 'sidewalk'(maximum speed limit 10 km/h, pedestrians are dominant)

Classification principle {50-D; 20-B; 10-A}

A '**50 km/h road**' (urban traffic environment 50 km/h). This is a traditional Dutch arterial street, consisting of three domains:

- **50-D**, the 'roadway' (speed limit 50 km/h, cars normative)
- **20-B**, the 'cycle path' (speed limit 20 km/h, cyclists normative)
- **10-A**, the 'sidewalk' (speed limit 10 km/h, pedestrians normative)
- Note: in the example on the left you see a zone with parked bicycles on the left-hand side of the cross-section. This domain does not belong to the pedestrian domain 10-A and is therefore indicated by Ø.

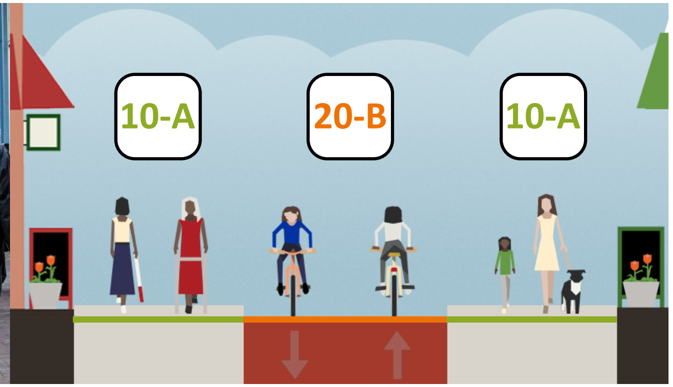
Classification principles: possibilities for customization

In addition to the most common classification principles, there are also many possibilities for customization. Some examples are:

Classification principle {20-B;10-A}

A **pedestrian area with a bicycle lane** (urban traffic environment 20 km/h), consisting of two domains:

- **20-B**, the 'cycle path' (maximum speed 20 km/h, cyclists normative)
- **10-A**, the 'sidewalk' (maximum speed 10 km/h, pedestrians normative)

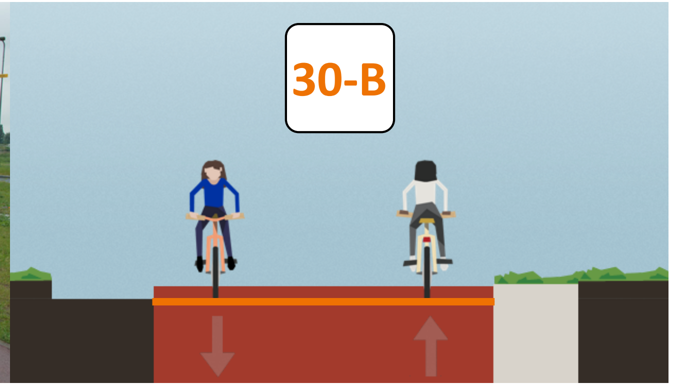


Classification principle {30-B}

A separated **fast cycling route** (urban traffic environment 30 km/h), consisting of a single domain:

- **30-B** (the speed limit: 30 km/h, bicycle-like norm)

This is a clear example of customization: a cycling domain that is set up for a maximum speed of 30 km/h, so that fast bicycles can travel more easily. Pedestrians could use it, but this is not recommended due to differences in kinetic energy.



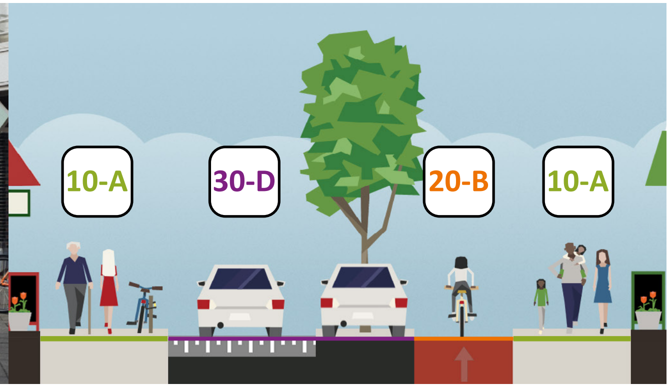
Classification principle {30-D; 20-B; 10-A}

A '**30 km/h street with important car function**' (urban traffic environment 30 km/h) consisting of three domains:

- **30-D**, the 'roadway' (speed limit 30 km/h, cars normative)
- **20-B**, the 'bicycle path' (speed limit 20 km/h, cyclists normative)
- **10-A**, the 'sidewalk' (speed limit 10 km/h, pedestrians normative)

This is also a customized option: 30 km/h is the speed limit here, but the domain is designed (in profile and length) for cars. These are roads where a speed limit of 30 km/h is desired, but the intensity of car traffic is too high to allow them as guests, for example, because they are part of a main route.

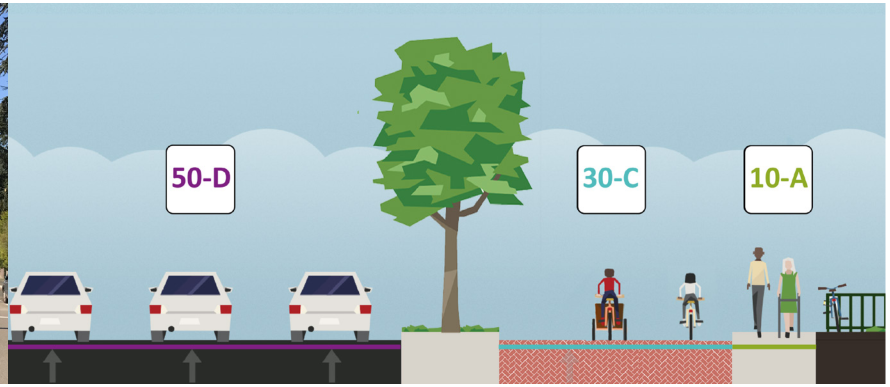
Source: Kim Johnson



Classification principle {50-D; 30-C;10-A}

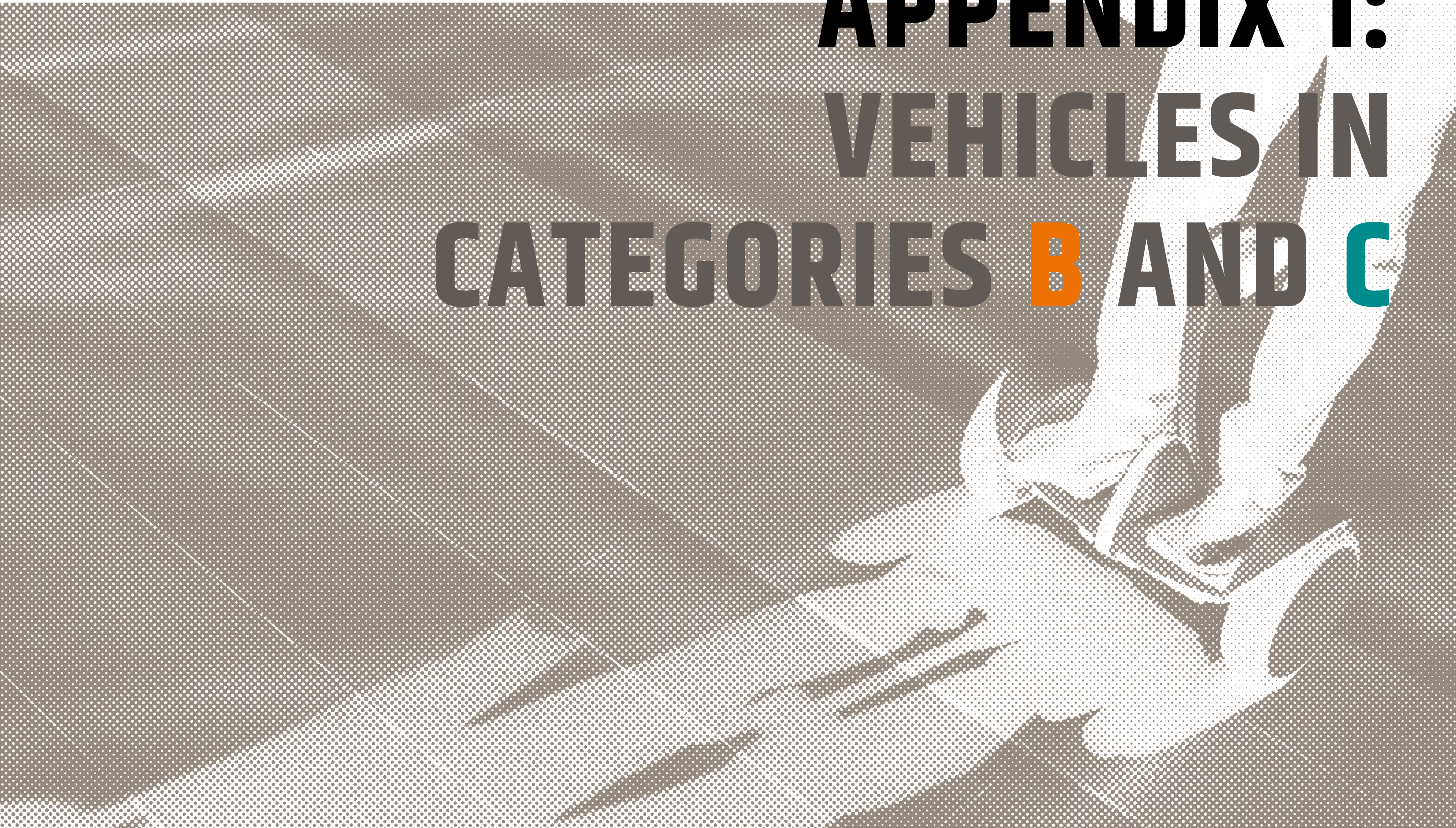
A '**50 km/h road with LMV** (urban traffic environment 50 km/h), consisting of three domains:

- **50-D**, the 'road' (maximum speed limit 50 km/h, cars are the design vehicle)
- **30-C**, the parallel access lane or 'LMV road' (maximum speed limit 30 km/h, LMV is the design vehicle, shared with bicycles)
- **10-A**, the 'sidewalk' (maximum speed limit 10 km/h, pedestrians normative)



APPENDICES

APPENDIX 1: VEHICLES IN CATEGORIES B AND C



Vehicle Family	OPERATING SPEED					
	0-10 km/h	10-20 km/h	20-30 km/h	30-40 km/h	40-50 km/h	>50 km/h
A "Pedestrians"	**A10** walking	**A20** jogging				
B "Bicycles" < ~ 35 kg		**B20** bicycle scooter hoverboard e-skates	**B30** e-bike e-scooter monowheel	**B40** speed pedelec, race-bicycle		
C "LMV" < ~ 350 kg		**C20** cargo bike bicycle "bus" Segway	**C30** e-cargo bike mobility scooter micro-car light		**C50** moped micro-car small NEV	**C50+** motorcycle motorscooter
D "Cars" < ~ 3500 kg					**D50** large NEV	**D50+** car delivery van
E "Trucks" > ~ 3500 kg						**E50+** truck lorries bus
F Rail vehicles						**F50+** tram light rail

The Good Street approach distinguishes between vehicle families (based on mass) and further classifies them according to achievable speed. In the overview on the right you will find the most common vehicles. The number of small light vehicles ("micromobility") in vehicle families B and C, is increasing. Some of these vehicles fall within an existing legal class, while others are not yet recognised as a means of transport and may not be used on public roads in some countries at the time of writing (spring 2020). Since it is only a matter of time until they are legislated, we have also included these means of transport in the list of examples. This demonstrates how diverse the family of cyclists and light motor vehicles is and what the possible place on the road of these means of transport can be. This overview is not exhaustive.

***Figure B1**: Vehicle types - a further distribution of vehicle families into vehicle types on the basis of achievable speeds, with examples of vehicles that belong therein.*

B20 - Bike speed 10-20 km/h

According to the classification by vehicle families, in addition to bicycles, other light vehicles weighing up to ~35 kg also fall into this category (motorised or non-motorised).

Hoverboard

Most hoverboards can reach 12-15km/h

Source: Shutterstock

Kick Scooter

Non-electric kick/step scooters

E-skates

These have a maximum speed of 12km/h

Segway

These vehicles are generally limited to approximately 18km/h

Source: shutterstock

B30 - Bicycles 20-30 km/h

In addition to the electric bicycle (e-bike), this also includes electric scooters, e-skateboard and one-wheeled electric vehicles under ~35kg. Most of the electric vehicles in this category are limited to 25km/h.

E-scooters

Source: Segway-Ninebot

One-wheeled vehicles

Source: Segway-Ninebot

B40 - Bicycles 30-45 km/h

This category includes bicycles with an achievable speed higher than 30km/h. This also includes racing bikes.

Speed pedelec

This is an electric bicycle that is limited to 45km/h and has a maximum power of 4,000 W. In practice, the cruising speed is approximately 33km/h and the bicycles have a power output of 500-750W. Because the achievable speed is usually lower than 40 km/h, we have classified this bicycle in category B40. At first sight the speed pedelec resembles the e-bike. In reality however, there are differences in appearance. In the Netherlands, speed pedelecs are equipped with a yellow moped licence plate and users are obliged to wear a helmet.

Source: ANWB

C20 - Light motor vehicles 10-20 km/h

This includes, for example, mobility scooters (with a limit <20km/h), the Stint, non-electric cargo bikes, and Segway-like vehicles, weighing up to ~350 kg.

Mobility Scooter (<20km/h)

Mobility scooters are available in different versions. Most models are limited in speed to 12-17km/h.

Stint

This vehicle has been specially developed for childcare. The vehicle has a maximum speed of 18km/h. Following a serious collision in the Netherlands, its access to the public road was revoked in 2019. We've left this vehicle in the overview to show where this type of vehicle fits within the vehicle families and what consequences the achievable speed in combination with the mass has for the location on the road.

Source: Shutterstock

Cargo bike

The cargo bike with two, three or four wheels has a mass well above ~ 35kg. Therefore, this bike fits within the light motor vehicle family..

C30 – Lichte motorvoertuigen 20-30km/u

This includes motor bikes (<25km/h), motorized scooters (mopeds) (<25km/h), electric cargo bikes, mobility scooters (<25km/h), all weighing up to ~ 350 kg. All vehicles in this category are limited to 25km/h.

Motor Bike(<25km/h)

Motor bike is the legal term for powered two-wheelers, which are limited to 25km/h.

In principle, these are the same vehicles as the moped category, only the achievable speed is lower. In the Netherlands, the motor bike has a blue licence plate on the back. Here we show an example of a light motor bike.

Motorized scooter (Moped) (<25km/h)

Legally, the motorized scooter is a moped (see next page). Scooter is a model, an appearance. Usually the weight of scooters is higher. Basically, these are the same vehicles as the moped, only the achievable speed (25km/h) is lower. In the Netherlands, the motorized scooter has a blue licence plate on the back.

Mobility Scooter (20-25km/h)

Mobility scooters are available in different versions. Some of the models are limited to a speed of 25km/h.

Electric cargo bike

The electric cargo bike with two, three or four wheels has a mass well above ~ 35k.

Source: Shutterstock

C50 - Light motor vehicles 30-50 km/h

This includes motor bikes (30-45km/h), mopeds, and covered mobility scooters. All are limited to a speed of 45km/h.

Motor Bikes (30-45km.h)

Motor bike is the legal term for powered two-wheelers, which are limited to 45km/h. The motor bike (30-45km/h) has a yellow licence plate on the back. Here we show an example of a light motor bike. Note: In the Netherlands, motor bikes are allowed to travel at 45km/h on the road. However, for the shared bicycle tracks (i.e. fast cycle routes) a different speed limit of applies, of 40km/h outside the built-up area and 30km/h inside the built-up area.

Moped (25-50km/h)

Legally, the scooter is a moped. A Scooter is a model, an appearance. A moped is also usually heavier. In the Netherlands, it has a yellow license plate on the back.

Mini car

These are covered vehicles that look a lot like small passenger cars. They are equipped with a moped plate. The best-known brand is the 'Biro'.

Covered mobility scooter

These are covered vehicles that look like mopeds.
However, they are narrower. As mobility scooters (intended for the disabled) they are allowed to drive on the road, the footpath, and on the bicycle path and at an appropriate speed. They are require a licence plate. The best-known brand is the 'Canta'.

C50+ - Light motor vehicles >50km/h

Hieronder valt de motorfiets en motorscooter.

Motorcycle

Motorcycle is the legal term for motorized two-wheeled vehicles (and in some cases three-wheeled) that can go faster than 45km/h. Just as with motor bikes and mopeds, there are also scooter models. There is also variation in weight and achievable speed.
Below an example of a regular motorcycle.

Motor scooter

Legally, the motor scooter is a motorcycle. Scooter is a model, an appearance. Within this category there is a difference in weight and achievable speed. The lightest motor scooters have the same appearance as the motorized scooter or moped; these can often be 70 or 80 km/h. There are also slightly heavier models with more power. Finally, there are large motor scooters with three wheels, which we classify as LMV if they weigh < ~ 350kg.

APPENDIX 2:
BRIEF DESCRIPTION OF THE GOOD STREET PILOTS

The Amsterdam, The Hague, Groningen, Rotterdam and Tilburg carried out pilots after the publication of the first edition of The Good Street. As a result, the methodology has been applied in practice and has subsequently been further refined. The Helmond and Utrecht pilots were development pilots and took place in the run-up to the publication of the first edition of The Good Street (then known as 'Traffic in the City'). A preparatory pilot also took place in Rotterdam at that time.

Amsterdam

Rozengracht

In three workshops with employees of various disciplines at the municipality of Amsterdam, we explored possibilities for improving traffic safety and the liveability of the Rozengracht. The Good Street methodology was used, identifying areas and dominant family/traffic environment, networks of different traffic management organizations, vehicle families, and road design. Eventually a variant for 20 km/h and 30 km/h was developed.

Positioning of LMV

By means of a workshop, we investigated how to deal with the LMV family in Amsterdam. We formulated the first ideas using international examples and the principles of The Good Street about mixing and separating.

The Hague

Willemspark/Archipelbuurt

The Willemspark/Archipelbuurt area was investigated in five workshops with employees from various disciplines of the municipality of The Hague. All steps of The Good Street were comprehensively examined, including identify areas and dominant family/traffic environment, networks of different vehicle families, Network Level analysis, location level design, and finally feedback and evaluation. Ultimately, a usable framework was created for the desired spatial qualities and regimes, also giving shape to the networks for the various families in connection with the activities and identity of neighbourhoods. This was then worked out into concrete designs for three selected locations.

Groningen

City centre plan

The municipality of Groningen created up a new Inner City Vision. In elaborating the vision, the Groningen team independently applied the principles of The Good Street. Central to this was designing for (desired) speed and drawing up design principles for inner-city public space. This led to a guideline for the layout of public space in the city centre and a design for the Astraat and Brugstraat. The result and the working method followed were discussed with the municipality by the The Good Street team. The design has since been executed.

Rotterdam

Nieuwe Binnenweg

The study area was the Nieuwe Binnenweg between the Eendrachtsplein and the 's-Gravendijkwal. The pilot was carried out with a multi-disciplinary team from the municipality of Rotterdam and a representation of residents and entrepreneurs of the Nieuwe Binnenweg. Over a series of six meetings, all steps of The Good Street were completed. This led to a new vision on the network of the various vehicle families and how this could be designed in 20 km/h and a 30 km/h environments. The final conclusion was that the methodology could not only be applied with official representatives but preferably also with residents and entrepreneurs. Only with proper participation can improvement plans take maximum account of users' and residents' wishes. Due to this participation, the plan is more likely to exhibit positive public support.

***Figure B7**: A redesign of the Nieuwe Binnenweg in Rotterdam based on 'The Good Steet' methodology.*

Tilburg

Goirkestraat

Tilburg has many old invasion routes, such as the Goirkestraat. In connection with a major maintenance plan, the Goirkestraat was examined using the The Good Street methodology. To this end, three workshops were held with a team formed from various municipal departments. In addition to residential activities, the Goirkestraat is also characterized by two special museums: the Textile Museum and the "de Pont" museum. The workshops yielded new ideas for the redevelopment of the Goirkestraat and its surroundings as well as a traffic flow that enhances the street's quality of life.

Helmond

Centre area

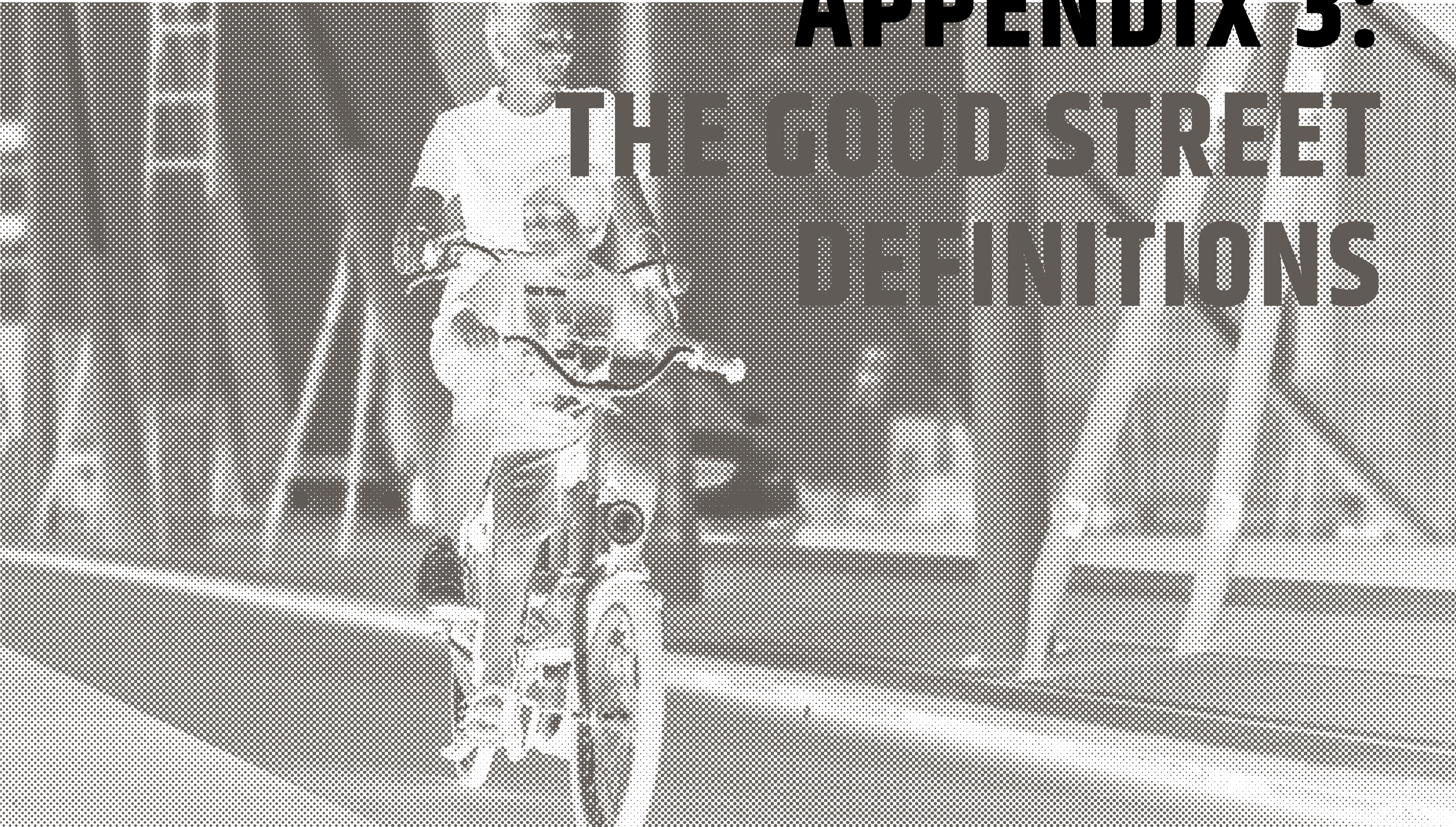
The centre of Helmond has long been intersected by the N270. In a series of four workshops, a multidisciplinary team from the municipality looked at how the current planning of traffic and urban development is done and how the The Good Street methodology would fit into the process. The application of the methodology yielded the first ideas on how the dominance of the N270 could be reduced, how the two urban districts on either side could be better connected, and how (partly as a result of this) the overall quality of living could be improved.

Utrecht

Centre area

Together with a team from the municipality of Utrecht, the The Good Street team analysed the city centre area. The first principles of The Good Street have been tested, and further details have been worked out on how to deal with speed regimes, the speeds for the different vehicle families and the concept of being a "guest".

APPENDIX 3: THE GOOD STREET DEFINITIONS



- ***Vehicle family***: A collection of vehicles of similar mass. (The maximum mass of successive vehicle families increases by a factor of 10).

- ***Vehicle type***: A collection of vehicles, within the same vehicle family, of comparable achievable speed (within a range of 10 km/h).

- ***Achievable speed:*** speed that a vehicle can normally achieve, i.e. without excessive effort on the part of the rider or (illegal) acceleration of the vehicle.

- ***Defining vehicle family:*** the vehicle family that is dominant in the spatial design.

- ***Urban traffic environment***: a street (or area of streets) where a certain speed limit applies, possibly with special requirements from spatial quality or traffic networks.

- ***Domain***: physically separate part of the public domain within which a speed limit applies to all vehicles and vehicle types using that part of the public domain, and whose design is based on a normative vehicle family and a design speed appropriate to the speed limit in that domain.

- ***Classification principle***: A means by which, in a given urban traffic environment, public areas can be subdivided into domains in such a way that all vehicle types (permitted in the urban traffic environment in question) can be operated safely.

- ***Spatial quality:*** a qualitative concept that can be customised and for which 'The Good Street' approach describes.