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Community Research

New Means to PROMote Pedestrian Traffic in Cities

GUIDEBOOK

ENERGY, ENVIRONMENT
AND SUSTAINABLE DEVELOPMENT

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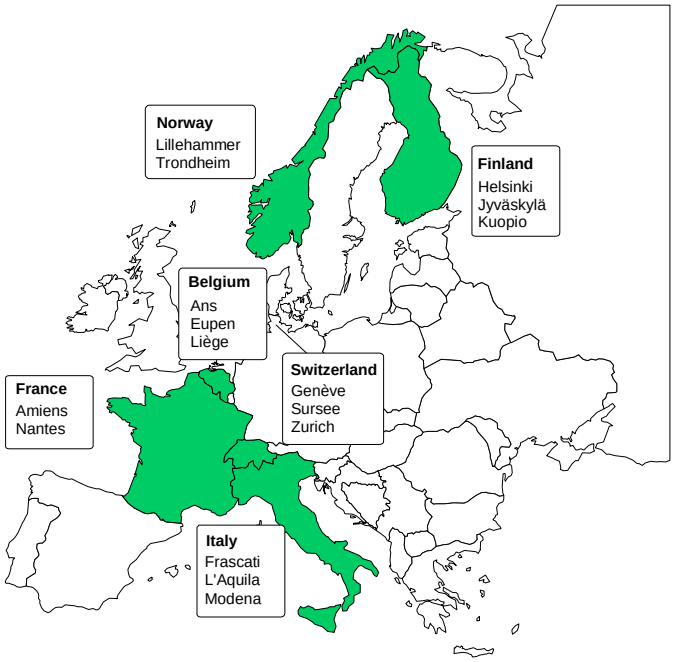
Case cities



Home pages of the project:
http://prompt.vtt.fi

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Preface

PROMPT - New Means to Promote Pedestrian Traffic in Cities - is a project under the EU's Fifth Framework Programme, Energy, Environment and Sustainable Development, Key Action 4: The City of Tomorrow and Cultural Heritage, Thematic Priority 4.4.1: Strategic approaches and methodologies in urban planning towards sustainable urban transport.

The main purpose of the PROMPT project was to improve the sustainability of urban mobility as well as to upgrade the urban environment, by promoting the choice of non-motorized transport modes instead of motorized ones when this is reasonable. The project concentrated especially on the promotion of *walking*, which is the man's original and most natural way of mobility.

The basic idea behind the project was to avoid striving after partial solutions before becoming aquainted with *all* the problems inherent to the situation in question. The danger with partial solutions is that they may impede the finding of solutions to the other inherent problems. For achieving best results all the inherent problems should be solved *at the same time*. Nevertheless, many problems are congruent or more or less independent so that also partial solutions can often be successful. Anyway, the main part of the work in the project concentrated on disclosing prevailing problems in pedestrian environments. For this purpose these were analyzed according to six different themes, which were:

1. *Safety*
2. *Accessibility*
3. *Comfort*
4. *Attractiveness*
5. *Intermodality and*
6. *Implementation.*

Only after these analyses different solutions were searched for the revealed problems. Before that the problems were still grouped to more or less coherent problem clusters. The search of the solutions was started by a common brainstorming workshop.

A great number of different deliverables has been the outcome the project. However, the most important of them is the deliverable "*PROMPT Solutions Report*". The other deliverables deal mainly with the various analyses of the case areas according to the before mentioned six analysis themes. Only the synthesis reports of these analysis themes plus some of the corresponding national reports are publicly available.

This guidebook does not anymore touch on the analysis part of the project. This is rather profoundly described in the synthesis reports of each of the analysis themes. Nevertheless, the main *problems* revealed in these analyses have been included in this guidebook. The *PROMPT Solutions Report* includes also descriptions and considerations of the new methods used in the various analyses in order to offer them for similar purposes in other corresponding situations.

The main task of the guidebook is to help in finding proper solutions to specific problems from the gathered set of solutions. Most of these are current best practice examples, but there are also many new and innovative ones within them. As stated before, the solutions are aimed to be holistic and coherent. They have also been grouped for constituting various *chains* of measures. On the one hand, one can consider at the same time technical, financial as well as political measures to promote walking. On the other hand, one can also consider the measures by starting from a general principal level and proceed towards more and more detailed measures as a chain of "what-to-do's" and "how-to-do's".

The guidebook begins with a list of revealed problems, first according to the previously mentioned analysis themes and then grouped to more or less coherent problem clusters. The connection between these is made by a reference. The easiest way to find relevant solutions is to look directly at the solution *families* corresponding the identified problem cluster in the *PROMPT Solutions Report*. these families are also briefly summarised in this guidebook. The solution families in the *PROMPT Solutions Report* are arranged hierarchically from most general descriptions to more and more detailed measures. In this way we sincerely hope that the book will find its place in the bookshelf of many end users helping them in their practical work concerning the improvement of the urban pedestrian environment.

Contents

1 Problems and solutions

The main idea of the project was to find out integrated solutions, which will solve several problems at the same time. This is important, because solutions to just one problem *may* sometimes even aggravate some other problems. For example, an underpass can significantly improve the safety problems of crossings, but can, on the other hand, make the accessibility issues more difficult, especially for the handicapped people. It can also render the crossing uncomfortable and unattractive. However, in many cases several problems can be solved parallelly. For example, reduced car speeds make at the same time the streets more safe, more accessible, more comfortable and more attractive for the pedestrians. On the other hand, this usually is in conflict with the desires of the car drivers.

In order to grasp better the problem entanglement and to find easier good integrated solutions all gathered problems were at first grouped into clusters where the problems seem to be mostly interdependent and mostly independent of the other problems. After that, general solutions were searched for these clusters of problems. These general solutions were then split into more and more detailed partial solutions. The general solutions with their detailed subsolutions were then named as *solution families*.

However, generally one *subjective* problem can have *several* good *solutions*. On the other hand, one solution can address *several problems* simultaneously. Thus, there is a “many-to-many” mapping between the problem and solution sets (Figure 1):

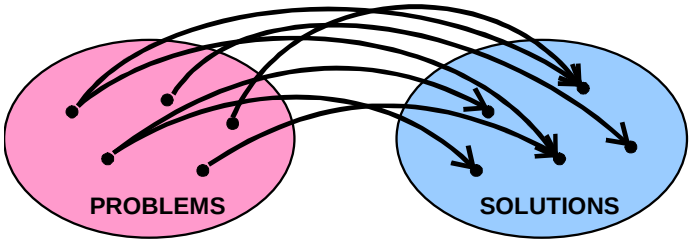


Figure 1 Many-to-many mapping between problems and solutions.

This complex situation means firstly that none of the defined problem clusters is totally independent of the other problem clusters. In fact, their clustering presupposes a certain set of solutions. This set is also usually quite obvious, because the problems are already interpreted as *causes* to actual subjective problems. For example, accidents with car, the main subjective safety problem, is expressed as a too heavy car traffic, too high car speed or lack of safe crossing facilities. Thus, the obvious solutions here are simply to reduce car traffic and speed and to provide safe crossing facilities. Nevertheless, these interpretations to subjective problems can be too hasty and the immediate solutions to them may even hamper the revelation of totally new creative solutions. This means that for radically new solutions the problem—solution mapping and the corresponding problem clustering can be different.

Secondly, this means that none of the solution families or even individual solutions is totally independent of the others. This becomes even obvious in the naming and description of the solution families. They are sometimes quite overlapping, which sometimes caused difficulties to choose the most appropriate family to certain individual problems. However, when one solution is a member of two or several families, it is defined only once and this definition is merely referred to in the other families. Generally, one can actually consider the families more like different view points to the same big issue than as just more or less separate families.

The solution families can also be considered as certain *chains* of “what-to-dos” and “how-to-dos”. This means that a general level solution can be broken down into more detailed and more practical solutions as means to implement it. These detail level solutions, in turn, can again be regarded as general level solutions to be implemented by still more down-to-earth solutions and so on. This hierarchy of the solution groups explains their naming as “families” of solutions having “parent solutions” and “child solutions”. However, as it already became clear, these families are not isolated. Besides that one solution can have several children it also can have several (more than two) parents. This means that solutions actually create intertwined family trees (Figure 2).

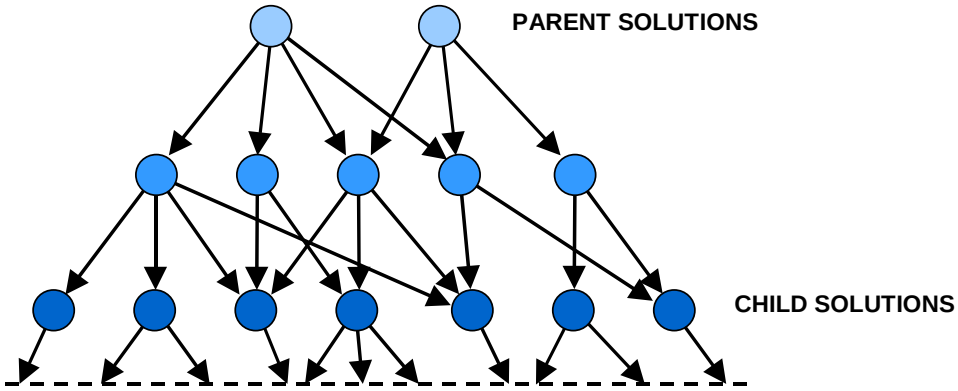


Figure 2 Intertwined solution families.

2 How to look at the reports

The main part of the project has been problem oriented. This means that most of the reports concern the analyses of the problems revealed on the pedestrian spaces of the several case areas of the project. These findings have been summarised and generalised in the publicly available summary reports of each analysis theme. Thus, the information is divided into six reports: *Safety Summary*, *Accessibility Summary*, *Comfort Summary*, *Attractiveness Summary*, *Intermodality Summary* and *Implementation Summary*. Besides these summary reports, also some National Reports concerning these themes are publicly available. More information on the case areas and the analyses can be obtained from the people responsible for the corresponding themes. The gathered solutions to the problems are described in *four PROMPT Solutions Reports*.

The methods used in the analyses of the case areas have been both technical such as mapping, measurements and collection of statistics and more socially oriented methods like questionnaires, interviews, workshops with local people and round tables of experts. Most of these new analysis methods are described also in the *PROMPT Solutions Report*.

If you are just interested to get a brief general picture of the whole project, please look at the available *Brochures*. They can be found in six different languages: English, German, French, Italian, Norwegian and Finnish. If you like to get acquainted with specific problems concerning pedestrian spaces in cities, please look at the theme-specific *Summary Reports*. The main problems detected at the case areas are also listed in this Guidebook. These are arranged both according to the analysis themes and to more or less coherent clusters of problems, which have been the basis for the solution families. If you are mainly interested in the collected solutions, it is best to look at the *PROMPT Solutions Reports*. However, the solution families are also briefly described in this Guidebook. Here it is also easy to see the connection between the problems and the corresponding solution families. After that, it is easier to browse the solutions more closely at the *PROMPT Solutions Reports*.

The solutions are hierarchically arranged into at most four levels. The *first level* is the most general one corresponding to the names of the families. This level tells the principal entity of measures to be implemented. This level is mostly important for the *policy makers*. However, there are also solution families, which are more or less totally aimed for policy making. Such families are, for example, A2 “Each Municipality should have a pedestrian policy” and B2 “Implementation of policy regarding localisation of facilities”. The *second level* of the solutions concerns mainly *urban and transport planners*. Examples are: A1.I “Organise the space”, A3.I “Enough housing and variety of facilities and meeting points in buildings along streets and their close environment”, C1.II “Speed reduction of motor vehicles”, E1.I “Built spaces interlaced with densely interconnected green nodes” and F1.III “Pedestrian-friendly design”. The *third and lower levels* are closer to *street planners, architects and designers*. However, the division between different end users is not always very clear here. Such lower level solutions are, for example, A1.II.1.1 “Simple, efficient and dense schemes”, A3.I.1 “Mixed use and a guaranteed minimum share of flats”, C1.II.4 “Mixed use zones” and F1.III.1 “Pedestrian-based space design”.

For research purposes, the project offers some new analysis methods. These are briefly described and assessed in the *PROMPT Solutions Report*. How they have been used in practice and the results achieved by them become evident in the theme-specific *Summary Reports* and more in detail in the available *National Analysis Reports*.

3 Pedestrian categories considered

It is clear that problems and solutions concerning the pedestrian environment depend very much on the different pedestrian types. A solution apt to one category can even be quite unsuitable for another. For example, a sign at a proper height for a child can be rather dangerous for a visually impaired adult person. However, in general one can say that if the needs of the weakest groups have been taken into account in the solutions, they most probably are also good or satisfactory for the stronger and healthier groups. Thus, the most vulnerable users and those with most difficulties with walking were taken as the yardstick in this project. As such "key" groups have been defined in the project

1. *school children,*
2. *aged,*
3. *disabled and*
4. *pedestrians with burdens.*

Of course, there are also other vulnerable pedestrian groups. Such are, for example, pregnant women, totally blind people, mentally disabled and deranged people. In addition, the disabled can be classified further to those using wheel chair, those using rollator and those using crutches or canes. Mothers (or fathers) with small children constitute a vulnerable group as well. There are also clear differences in traffic behaviour between children in the first grade and children in the upper grades of the comprehensive school. Actually, this difference was indeed taken into account in the school children questionnaire made in connection with the safety and accessibility analysis. However, considering all these groups separately would have been impossible within the resources of the project and, thus, those four above-mentioned groups have mainly been considered as representatives of the most vulnerable pedestrian groups.

Other important issues concerning pedestrians are, whether they are in a hurry or not, what is the purpose of their walking trip, their acquaintance with the area, their mood and their cultural background. All these matters have been, more or less, touched in the street interviews in connection with the comfort analysis.

It is also obvious that all these categories are not wholly independent of each other. For example, aged people normally have also mobility problems. People going to work are normally in a hurry, while people on idle walk have no hurry. A new visitor is often somewhat stressed, when trying to find certain places at the area. The people with babies are most often females, and so on. Because of this, the pedestrians could also be statistically typified to certain groups with several interdependent properties. As a matter of fact, such classification was made in connection with the comfort analysis.

4 Situation and scale

Also different *situations* regarding climate, weather, topography, location in the city structure, historical values, cultural differences etc. have their own impacts on the problems and solutions. Here too one has had to concentrate only on few typically different situations. As such situations were considered in this project:

1. *Urban density*
2. *Topography*
3. *Climate*
4. *Weather*
5. *Location*
6. *Distance to the nature*
7. *Age of the buildings*
8. *Design principles*

However, not all these categories have been considered systematically. In fact, only few of them became significant in connection with certain problems and solutions. For example, urban density varies considerably between the case areas and is a significant issue. The same holds with the topography. Winter causes certain problems especially in the North. On the other hand, distance to the nature, age of the buildings and design principles did not come up as significant issues. Very many of the revealed problems are actually common to all different situations. This concerns, for example, the general crossing offer to the pedestrians.

Besides, these situations regarding the pedestrian environment itself, an important categorisation has also been the scale of considerations. For this respect, the considerations were divided into:

1. *urban scale considerations*
2. *street scale considerations*

Which are urban and which are street scale problems? It seems that the border goes somewhere between, on the one hand, the examination of crossings, pavements, urban furniture etc. and, on the other hand, the examination of the whole pedestrian network, distribution of services and stops, landmarks, supply of the area etc. Nevertheless, this distinction is important, when considering the different end users from decision-makers and planners to architects, designers and street builders.

5 Theme-specific problems

All the thematic analyses revealed about 50 general level problems (150 in detailed level) of existing pedestrian environments. Some problems were actually the same within different themes. However, this does not mean a simply overlap, since actually the same problem has only been illuminated *from different points of view*. For example, dense motorised traffic can be a problem for safety (danger), for accessibility (barrier), for comfort (noise), for attractiveness (discontinuity of walkways, disturbance) or for intermodality (access to bus or tram stops) alike. Nevertheless, the solution can still be the same independent of the different viewpoints. For example, in the example above the solution to reduce motorised traffic relieves the problem while looking it from all its viewpoints. Below are listed some of the most prominent problems under each of the analysis themes. It is interesting to note that the "softer" the analysis theme is the more it has common or overlapping problems with the other themes. Especially prominent this becomes with attractiveness.

5.1 Safety

- Cars have too high speed. C3
- "Woonerf" streets, where pedestrians legally can walk or play on the street, have not been used where applicable. A1
- Grade separation of pedestrian paths and car traffic has not been used when applicable. A1, C1
- Slippery pavements cause falling accidents, especially in wintertime. A2
- Separation between bicycle lanes and walking paths is missing. A1
- Zebra crossings are not located as close to intersections as possible. A2, C2
- Median refuges at non-signalised intersections are missing. A1, C2
- Traffic lights don't have right timing for pedestrians, especially for the elderly. A3, C2
- Maintenance of the pavement is poor. A2
- Car parking or other obstacles impair the visibility, especially as regards children. A3, C1

5.2 Accessibility

- Services are segregated, apart and far from homes. B2
- Streets have high motor traffic volumes. C3
- Walking paths include steep hills or slopes. A1
- The pedestrian network is lacking of links and has a poor connectivity. A1, C2
- Crossing facilities are poor (wide streets, long waiting times, short sight distances, traffic, geometry, etc.) A2, C2, D2
- Various factors cause a separating effect (rivers, railroads, topography, poor crossings, lacking or poorly phased traffic lights, motor traffic) A2, C2
- Pavement has a poor quality. A2, E2
- Sidewalks are too narrow. A1
- Kerbstones and steps cause obstacles. A3

- Winter maintenance is poor; snow causes obstacles. A2
- Parked cars cause obstacles. A2, C1

5.3 Comfort

- Lack or scarcity of seating. B3
- Bad air conditions. F1
- Negative impact of traffic (high speed, high flow). C3
- Too high noise level (motorised traffic). F1
- Lack of facilities (toilets, drinking water, food stalls). B2, B3
- Lack of appropriate spaces (dimensions, weather protection, liveliness). A1, B3
- Bad smells (gas emissions, other disturbing smells). F1
- Socially insecure places. F2
- Poor pavement materials and maintenance. A2, E2
- Scarce lighting (no differentiation for drivers and pedestrians). B1
- Few features helping orientation (lack of signs, signposts, information, guiding for visually impaired etc.). B3, E1
- Lack or scarcity of vegetation or water sources. E3

5.4 Attractiveness

- Shortage of appropriate pedestrian spaces (insufficient pedestrian network, narrow sidewalks, lack of spaces for social activities day and night). A1
- Lack or insufficiency of natural features (lack of vegetation, lack or bad appeal of sources of water, green areas too sparsely, too small green areas) E3
- Lack or deficiency of services, facilities and commercial activities (too long walking distances to daily services, lack of local services and entertainment services, long distances between services). B2
- Unfriendly and overwhelming built environment (bad dimensional relations of pedestrian spaces, lack of valuable architecture, monotonous buildings, walkways with bottlenecks). A1, E4, F2
- Intensive visual and physical impact of the vehicular mobility (large visible parking areas, misallocation of parking lots, illegal parking at street corners, on walkways, at pedestrian crossings, on pedestrian spaces etc.). C3
- Lack or inappropriateness of urban furniture and equipment (seating, hip support, public toilets, urban furniture and its quality). B3
- Lack of features increasing the feeling of identity and orientation (lack of elements for orientation, fragmented area, absence of borders, unattractive access to the area, unclear hierarchy of outdoor spaces, missing “genius loci”.) A1, E1
- Low maintenance and management of open spaces (pavements, green areas, lighting, urban furniture, facades etc.). A2
- Lack and inappropriateness of lighting (no differentiation, shadowed by trees, unimaginative use, green areas poorly lit, poor design). B1
- Monotony of details and finishing (excessive use of same materials, too formal design of spaces, monotonous facades etc.). E2

5.5 Intermodality

- Poor offer of the public transport (long waiting times, too long distances to the stops). D1
- Inappropriate crossing offer (badly planned crossings or wrongly timed traffic lights cause illegal crossings). A2, C2, D2
- Inappropriate pedestrian spaces along the path and at the stops (unofficial paths, short cuts, insufficiently space at the stop, uncomfortable spaces). A1, C2, D2
- Hindrances and barriers for the most vulnerable pedestrians to get on and off the bus (platform height, type of bus, visually impaired, wheelchair users, disabled people). A3
- Unsuitable equipment at stops (poor information, poor equipment, no shelter, insufficient seating). B3
- Bad maintenance of the public transport stops (not clean, lack of maintenance). A2

6 Problem clusters

Before starting the search for solutions, the revealed problems were still regrouped according to their interdependency into six bigger clusters. These clusters also establish the basis for the developed twelve solution families:

A Lack of or scarce offer of physical and social space

A.1 Shortage of physically and socially appropriate pedestrian spaces

A.2 Poor maintenance and management of open spaces

A.3 Poor infrastructure for the most vulnerable pedestrians (hindrances and barriers)

B Lack of equipment and services in outdoor spaces

B.1 Lacking or inappropriate lighting

B.2 Lack, deficiency or long distances of daily services, facilities and commercial activities

B.3 Lacking or unsuitable urban furniture and equipment

C Interference with motor vehicles

C.1 Cars invading the pedestrian space

C.2 Poor pedestrian network: discontinuity of paths and inappropriate crossings

C.3 Physical, visual and psychological interference with vehicular mobility: speed and flow inconsistent with the pedestrian pace

D Poor support by and connection to other modes of transport

D.1 Poor public transport services

D.2 Poor and unsafe crossings to bus/tram stops

E Poor natural, architectonic and psychological features of the environment

E.1 Insufficiency or lack of features enhancing the feeling of identity and orientation

E.2 Inappropriate or monotonous material use, detail or finishing

E.3 Lack or insufficiency of natural features

E.4 Unfriendly or overwhelming built environment

F Poor environmental performance

F.1 Poor environmental response

F.2 Insecurity

7 Solution families

Totally twelve solution families were developed on the basis of the six problem clusters. The problem clusters and their corresponding solution families are listed below. Closer descriptions of the families and of the solutions themselves within each family are included in the *PROMPT Solutions Reports*. There may be some differences in the indexing of the solutions in this Guidebook and in the *PROMPT Solutions Reports*, which, however, should not make the finding of the appropriate solutions yet difficult.

Cluster of problems A:

A Lack of or scarce offer of physical and social space

- Shortage of physically and socially appropriate pedestrian spaces
- Poor maintenance and management of open spaces
- Poor infrastructure for the most vulnerable pedestrians (hindrances and barriers

Families of solutions A:

A1 Give priority to pedestrians in transport planning

- 50 % of public space for pedestrians; priority to pedestrians
- A continuous and dense pedestrian network
- Good architectural design of the public spaces

A2 Each Municipality should have a pedestrian policy

- Establishment of favourable walking policies
- Training, education, dialogue, awareness of users' needs
- More investments in public spaces
- Follow-up of implementation processes

A3 Living streets day and night

- Mixed use in districts, public facilities along the streets, multiple use of public spaces
- Private and public spaces: appropriate continuity and separation
- Loose borders between buildings and streets

Cluster of problems B:

B Lack of equipment and services in outdoor spaces

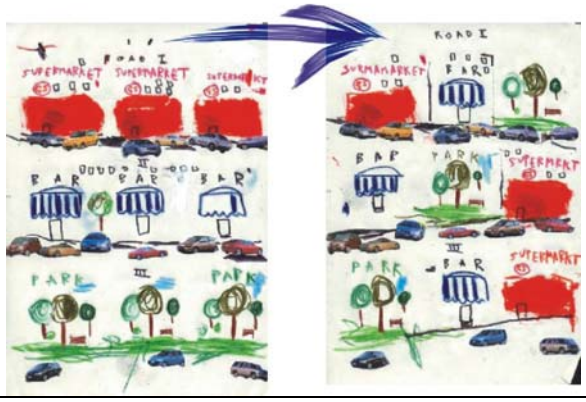
- Lacking or inappropriate lighting
- Lack, deficiency or long distances of daily services, facilities and commercial activities
- Lacking or unsuitable urban furniture and equipment

Families of solutions B:

B1 Public space as a living room

- Appropriate high-quality pavements
- Sufficient and appropriate urban furniture with good design and maintenance
- Differentiated and appropriate lighting
- Easy orientation
- Weather protection

B2 Implementation of policy regarding localization of facilities



- Shops, other services and meeting points at close range
- Set-up promotion of daily shops and services near the homes
- Prevent establishment of supply competition in city peripheries

Cluster of problems C:

C Interference with motor vehicles

- Cars invading the pedestrian space
- Poor pedestrian network: discontinuity of paths and inappropriate crossings
- Physical, visual and psychological interference with vehicular mobility: speed and flow inconsistent with the pedestrian pace

Family of solutions C:

C1 In each development, consider that you have to move as a pedestrian and not only as a car driver

- Avoid through traffic
- Minimize traffic around schools
- Car-free residential areas
- Zones with traffic limitations, parking restrictions, use of urban tolls.
- Speed control by design
- Mixed use zones
- Give pedestrians general priority over traffic

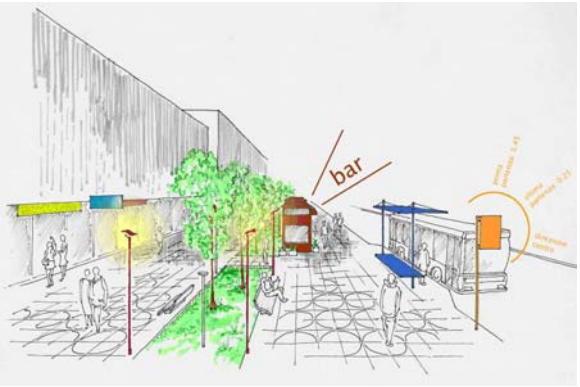
Cluster of problems D:

D Poor support by and connection to other modes of transport

- Poor public transport services
- Poor and unsafe crossings to bus/tram stops

Family of solutions D:

D1 Public transport for all



- Dense network of stops within short walking distances
- Direct pedestrian access to stops from all directions and for all users
- Secure and comfortable bus stops, day and night
- Attractive public transport supply

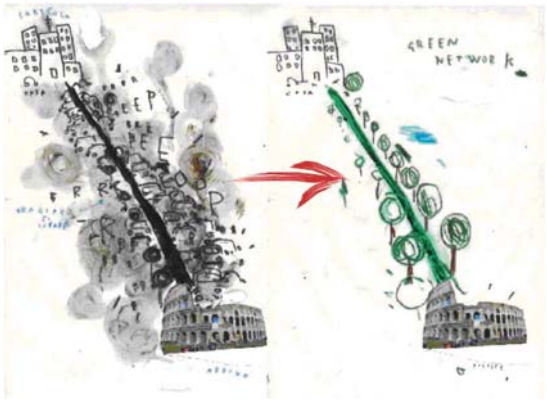
Cluster of problems E:

E Poor natural, architectonic and psychological features of the environment

- Insufficiency or lack of features enhancing the feeling of identity and orientation
- Inappropriate or monotonous material use, detail or finishing
- Lack or insufficiency of natural features
- Unfriendly or overwhelming built environment

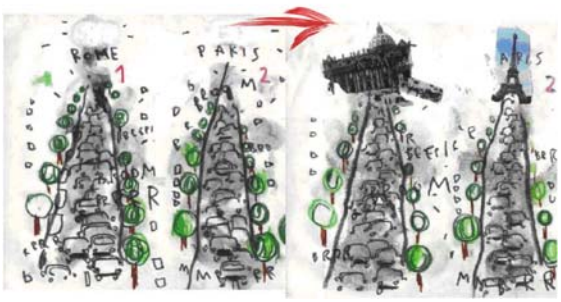
Families of solutions E:

E1 A green network in every city



- Built spaces mixed with green nodes densely interconnected
- Connections between green nodes by comfortable pedestrian paths
- Water and green elements, with their seasonal variation, integrated in the design
- Search for variety in design and utilization of green spaces

E2 Pedestrians always have to feel at home



- Design, materials, furniture and use of public spaces should enhance the local identity.
- Sequentially varied views
- Diurnal variations by lighting
- Essential and entitled pedestrian space

Cluster of problems F:

F Poor environmental performance

- Poor environmental response
- Insecurity

Families of solutions F:

F1 Integrate pedestrian scale in the city design

- City plans for people on foot
- Human scale and attractive detail design and lighting
- Manifold use of signs

F2 Noise control standards for outdoor spaces

- Urban planning and strategic measures
- Traffic management
- Creative design and land use planning for mitigating noise problems: barriers, low-noise materials, design of facades, disguise annoying sounds behind pleasant ones, etc.

F3 A clean and healthy outdoor space

- Standards and strategies for controlling air pollution
- Separate waste disposal for dog faeces
- City planning and traffic management that promotes cleanliness and healthiness
- Appropriate waste collection and street cleaning
- Maintenance programmes and strategies
- Utilization of water and green elements