Cycling Lab/Fietslab
Metropolitan Cycling
Laboratory

ViaCiclo – Associação dos
Ciclousuários da Grande
Florianópolis

Methodological Guide for Cycleway Evaluation

Florianópolis/Brazil– August 2010

1 \ Introduction

This paper is a short English version of the Portuguese "Methodology guide for evaluation of road cycling" (Guia metodológico para avaliação de vias ciclísticas). It briefly outlines the procedures and tools to implement an assessment process of cycle ways that were designed for cycling, using as much as possible free electronic instruments. The "Methodology guide" was derived from a pilot assessment project carried out by ViaCiclo in Florianopolis in the first half of 2010.

Cycle bridge crossing the BR 282 Road

The evaluation of cycleways is a project from Ciclobservatório (Observatory of Cycling Mobility of Florianópolis – Observatório da Mobilidade Ciclística de Florianópolis). Florianópolis is a medium sized city in the south of Brazil). The project is developed by ViaCiclo (Cycling Users Association of the Florianópolis and the Florianópolis Region – Associação dos Usuários da Grande Florianópolis) with the support of Cycling Lab (Fietslab – Dutch Cycling Metropolitan Laboratory) – Both are non-commercial organizations. More information can be found at Ciclobservatório www.viaciclo.org.br/portal/ciclobservatorio/ciclobservatorio.

Example of a non-diveded general traffic lane: João Gualberto Soares Road

2 \ Objective of the assessment of cycling routes

There are no regulations about types of cycling routes in Brazil and therefore there are no technical standards for their design. Although there is a large variety of road cirumstances (size and topography of cities, road types, adjacent land use etc.), it's important to move forward in the country and to develop technical standards for cycle routes. They must enable the bicycle being used as a means of transport. It is important that cycle routes are adequately safe and comfortable to use:

- For people that already cycle to improve the usage of their bike;
- For people that do not cycle to feel attracted and encouraged to become cyclists.

There is no known study to assess the technical quality of cycle lanes or the level of satisfaction of cyclists with cycle lanes in Brazillian cities. However, more and more cycle lanes are planned and even built.

- They imply minor adjustments in road infrastructure;
- Their construction is low cost;
- They cause the least possible interference for motorized traffic;
- They cause the least possible interference with the interests of land users the side of the road.

Example of cycle track : Beira Mar Sul Road

So cyclists who wish to improve cycling mobility in their city should take the initiative to urge the government to act. However, when this shows little result, they themselves must carry out the assessment of existing routes. This way they:

- Improve the level of technical knowledge of the cyclists themselves;
- Offer the government methods for technical assessment and measuring cyclists' satisfaction with cycling routes;
- Contribute to the growth of a "technical culture" that can be duplicated in other cities;

Example of cycle lane: Cachoeira neighborhood

- Enable monitoring of the quality of cycling routes over time.

3 \ What cycle routes to evaluate?

A cycle route system includes almost all public roads within a city: all streets and avenues, including the specific cycle paths. It is not possible (for most cities) to evaluate every street in the city, so a sample of streets must be taken. The set of streets in the sample must be choosen in such a way that they represent all types of streets in the city in all types of neighborhoods.

Most cities in Brazil have few amount of dedicated cycle ways, so it's possible (and recommended) to a assess them all.

This Guide is focused only on the dedicated cycleways. The assessment of the streets that do not have any cycle way will be done in the future.

Until now there is not a regulation that categorizes all types of cycling routes in the country. The categorization and characterization of cycling routes should be included in the law and in the practices of engineers and be implemented in the infrastructure of the cities.

For example, in case of Florianópolis the following categorization of road cycling was defined:

- **Cycle track**: exclusive lanes for traffic of bicycles, with alignement independent of streets or isolated of the streets by physical barrier (wall, bed, block, fence, beacons or similar);

- **Cycle lane:** exclusive lanes for bicycle traffic, part of the road surface, but highlighted by painting on the pavement and/or reflective studs/bottons. A cycle lane can also be situaded on the sidewalk;
- **Signaled way**: way regulated for the cyclist to share the sidewalk with pedestrians or the street with motorized vehicles - brings together all the ways excluded by the above categories;
- **General traffic lane** (or shared street): all streets (public roads, avenues etc.), which by law may be used by cyclists.

Example of signaled way: Tapera neighborhood

4 \ Steps of evaluation process

The assessment process of cycling routes can be done by only one independent person, but it will have more support in the city's society if it is done by a team and if it is supported by a civil society organization, formal or not.

To perform the assessment of the city's cycling routes set out the following steps:

- Preparation of Planning - methodological, chronological, technical, human etc.;
- Elaboration of the requirements of the assessment;
- Provision of physical tools;
- Preparation of electronic tools;
- Assessment of each cycle route;
- Systematization of and communication about the final results of the evaluation.

The assessment of each cycle route itself, comprises the following steps:

- Field study;
- Preparation of the electronic database;
- Finding the assessors;
- The assessment itself;
- Systematization of the assessment results;
- Communication about the assessment results.

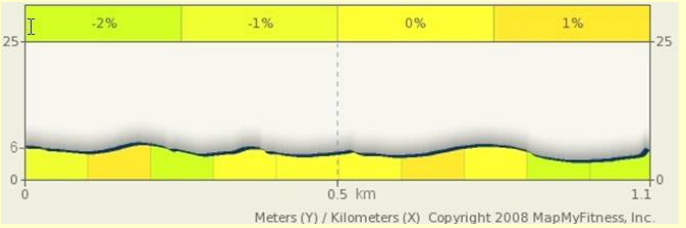
5 \ Tools for the assessment

To execute the assement the following physical tools are needed:

- Bicyle to cycle the routes;
- Stand;
- Measuring tools - measuring tape, and eventually level tool;
- Computer with internet connection;
- Photo camera, preferably with a video feature.

To perform the assessment the following **electronic** tools are needed:

- **General communication medium**: a website, webpage or blog (there are many free services, such as Blogger or WordPress) for permanent communication and to drop informations, results etc.;
- **Internal communication medium**: an e-mail account and an electronic group for communication (such as YahooGroups or GoogleGroups);



"Altimeter Charter" of bik lane of Rio Tavares neighborhood

- **Platform for the collection of data**: there are several platforms needed; the most important is a map sevice, such as GoogleMaps
- **Data processing and editing**: texts editor , spreadsheet, movie editor, photo editor;
- **Publication databases**: most important are an online photo gallery (such as PicasaWeb), a video channel (such as YouTube) and a map service (such as GoogleMaps);
- **Tools for the collection of opinions from users**: the main tool is an electronic survey tool (such as SurveyMonkey and EncuestaFacil).

6 \ Issues to be addressed in the assessment

The main issues to be addressed in the assessment of cycleways are:

- Safety, comfort and attractiveness for all people (considering age, gender, physic condition etc);
- Drainage of rain water;
- Shading;
- Illumination;
- Integration with public transport;

- Safety features at intersections that protect from cars;
- The potention to increase the number of users.

See questions of assessment in Attachment 1.

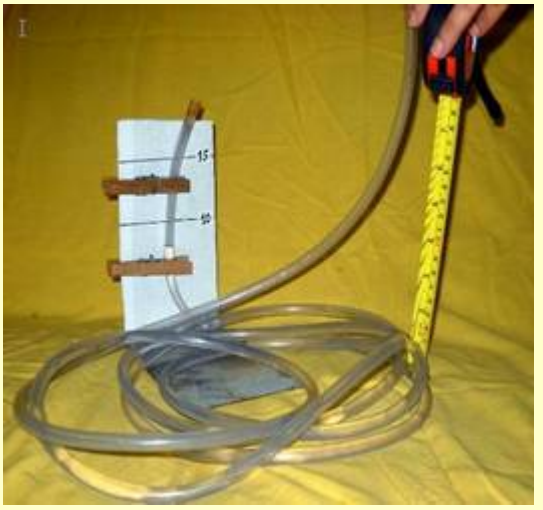
7 \ The Field Survey

In the fiel, the cycleway needs to be:

- Visited;
- Cycled in its entire length;
- Photographed;
- Filmed, if possible;
- Measured according to the items in the field survey form.

The data will be collected in two documents:

- **Field sketch**: aerial photo in which the relevant points of the survey are inserted;
- **Field survey form:** A table containing all the items to be measured or estimated, based on the issues described in paragraph 6 (see this Form in Attachment 1).



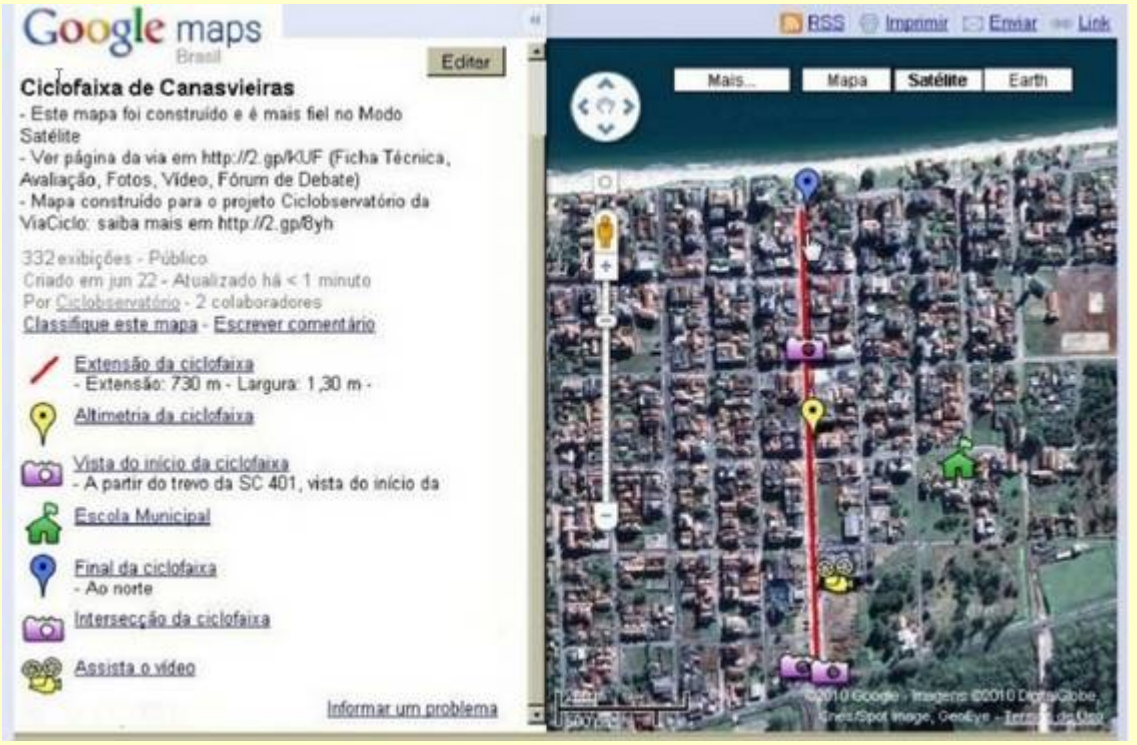
Level of hose to be operated by one person

8 \ Technical Form

The technical form must contain all information about the cycleway in the context of the road network. Aspects of geography, land use and occupation and measured data are included in this document. The main information to be found in the technical form are:

- The location, when the cycle way was constructed, which organization ordered the construction, original costs, source of funds;
- Integrity and maintenance of pavements;
- Amount and condition of signs;
- Places of flooding, obstacles
- Width, length;
- Quality of the surface, painting and the objects separating the cars
- Accessibility for children;
- Potential attractiveness;
- Sense of security;
- Sense of comfort.

9 \ Map



Electronic map of a cycle way in Canasvieiras in GoogleMaps

The map is an indispensable instrument for the assessment of cycle ways. A map should be made for each of the city's cycle ways. The following items should be annotated on the map:

- The cycle way itself and specific circumstances such as shared lanes on the sidewalk;
- Main services along the route such as schools, health clinics, shopping malls etc.;
- Critical points: points on the way that are dangerous or have other problems;
- Marked points that can display photos stored in the Photo Album;
- The altitude of the track, by an incorporated image;
- If a video has been made cycling along the way, the video can be displayed directly on the map (embedded) or be accessed through a link.

10 \ Photo album

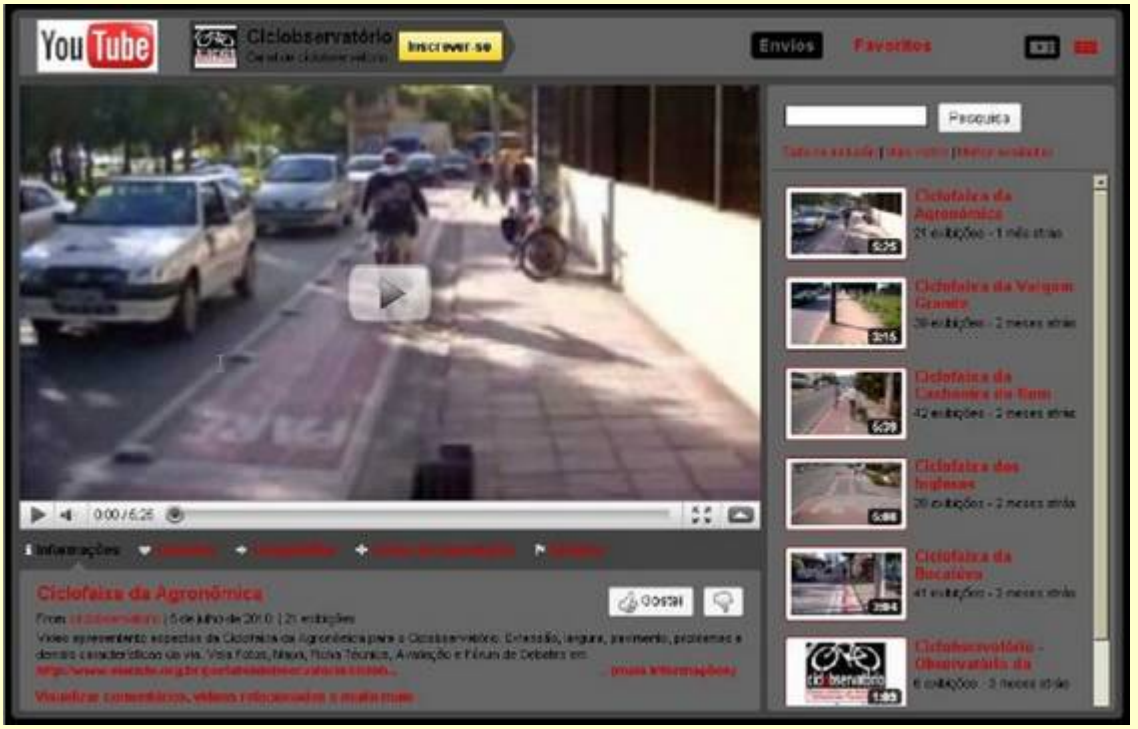
Photographs are an indispensable source of information for the assessment process. A good photo collection is helpful for the preparation of the techical form. Representive photos should be taken cycling the track cycling. The main issues to be photographed are:

- The beginning and the end of the cycle way.
- Horizontal and vertical signaling;

- Main services along the route such as schools, health clinics, shopping malls etc..;
- Obstacles and shortcomings;
- Intersections;
- Shared lanes.

Photo Album of evaluate system in the PicasaWeb

11 \ Video channel



Video Channel of evaluate system in YouTube

Although a video of the cycling way is an optional feature, it is a high quality addition to the assessment, especially if the recording is done ride in the bicicyle, showing diverse situations as the track conditions, intersections, movement of motorized vehicles etc..

12 \ Assessment by users

The survey of cyclists who use the cycle ways is the most important procedure in the assessment. The best way to collect their opinion is an inquiry of the cyclists when using the cycle way (in situ). However, if there are not enough people to perform the interviews, an electronic survey must be used.

The questionnaire should contain questions that allow the cyclist to assess all key aspects. Besides it is important to gather information about the respondent by including questions about age, occupation, gender and residential location. Questions should be formulated clearly and objectively. Types of response may be like:

- Appreciation, like "Excellent, Good, Medium, Bad, Very Bad";
- Level of agreement, from "1," which means "strongly disagree" to "5", which means "I agree completely".

Reform in the cycle way of Beira Mar Norte Avenue (photo by: Juliana Silva)

The electronic form should be shared with the community, as well as a map, photos and Technical Form. After completing the evaluation, the overall result should be disclosed.

13 \ Evaluation by specialists

Besides the assessment done by an inquiry among the cyclists themselves, it is recommended to perform a descriptive assessment by an inquiry among experts on urban mobility and/or road construction, experts belonging to the three categories below. For all the questionnaire is the same.

- **Experienced cyclist.** He/she is familiar with the vocabulary used in cycling mobility, knows a lot about the road structures and has knowledge of relevant technical and policy issues that involve the use of bicycles for transportation. Experienced cyclists can be found by asking for volunteers or be selected by the researcher from the cyclists in the inquirey
- **Qualified professional**: architect, civil engineer or traffic engineer. They have a technical view on cycling infrastructure. A technical report provides an analytic neutrality on the process, allowing to compare it with the views of cyclists and other experts.
- **Public manager.** The executive agents (Departments of City Planning, Transit and Works) should participate in the evaluation by a survey among their managers. The mere receipt of an evaluation form warns the public manager that the department should be aware of the quality level desired for cycling routes;
- **The coordinator of the assessment.** The coordinator him/herself should also give his/hers opinion on the quality of cycle routes. Using his/hers own knowledge and the results of the inquiries he may make a summary of the major aspects of cycleways. The suggested format for the assessment by the coordinator of the evaluation is a short text (two or three paragraphs), written by one or more team members, in which he/she emphasizes the positive and negative aspects of the cycle way and gives recommendations for improvements.

Cycle lane of Hercílio Luz Avenue

14 \ Systematization and monitoring

To make clear that there is a strong connexion, it is important to make a comprehensive and systematic report on all cycle ways, once they all have been assessed. This way it is easier to understand the cycling conditions in the context of the road system .

It is important that the final results of the assessment process are handed over to the public authorities, to civil society organizations and the press, to stimulate debate and in this way

accelerate the achievement of the main goal: to include the bicycle in the urban mobility system.

The road system of cities is constantly changing, driven mainly by urban growth and the increasing fleet of motorized vehicles. Therefore, it is necessary to monitor the development in the quality of cycling routes, repeating the assessment process every five years at least.

In addition, every new cycle way built should be object of an assessment, to keep the comprehensive overview of the city and to check whether it is constructed complying to the technical standards and whether the recommandations of earlier the assessments taken into account in the design process.

15 \ Attachments and complementary informations

In "Attachment 1" is the "form field survey" can be found, which is the base for technical form and the inquiry among cyclists and specialists.

In http://www.viaciclo.org.br/portal/ciclobservatorio/conceitos-referencias articles, texts, researches, technical orientations and other informations about cycle structures, assessments and urban mobility (almost all in Portuguese) can be found.

In http://2.gp/bhue open documents (DOC and XLS format) can be downloaded to use in assessments: form field survey, technical form of cycle way, assessment questionary for cyclists, assessment questionary for specialists, spreadsheet to calculate results (all in Portuguese).

In http://fwd4.me/PXg the full version of the "Methodological Guide" in Portuguese (of which this document is a summary) can be downloaded (in PDF format), including several attachments and additional information.

16 \ Publication and work data

- **Coordinator of Ciclobservatório**: André Geraldo Soares (Coordinator) e Roberta Raquel (Assistant), both from ViaCiclo;
- **Supervision of Ciclobservatório:** Architect Jaap Rijnsburger (Cycling Lab, The Netherlands);
- **Composing of "Methodological Guide for Cycle Paths Evaluation"**: André Geraldo Soares;
- **Review of the English translation**: Rob Hulleman (member of ViaCiclo, The Netherlands)
- **Photos:** All photos depict Florianopolis and are authored by André Geraldo Soares, except those with reference;
- **Date:** Pilot Project conducted between March and June 2010; Methodological Guide written in August 2010.

EXECUTION

SUPPORT

www.cyclinglab.org

www.viaciclo.org.br

www.udesc.br

ViaCiclo – Associação dos Ciclousuários da Grande Florianópolis

Funden on May 16 2001 - CNPJ 04.775.526/0001-02

Declared as Municipal Public Utility by the Law nº 7.636/2008

Declared as State Public Utility by the Law nº 14.566/2008

ViaCiclo: nine years ago promoting the bicycle as a means of transportation, recreation, sport and adventure in urban and rural regions of Florianópolis and Earth.

Bicycle: a vehicle that promotes democracy in mobility, access to city, social justice, quality of life and environmental sustainability.

Address: Rua Lauro Linhares, 944 - Trindade - Florianópolis/SC - CEP 88036-002

www.viaciclo.org.br – viaciclo@viaciclo.org.br

Associated in UCB – Brazilian Union of Cyclists

www.uniaodeciclistas.org.br

Member of Bici-SC – Cycling Mobility Network of Santa Catarina State

http://2.gp/cv3p

ATTACHMENT 1

FORM FIELD SURVEY

Via Ciclística	

ITEM	DATA
1) **Title**: official name, popular or assigned by researcher	
2) **Type of road cycling**: type/subtype of cycleway (cycle track, cycle lane, signalized road, sidewalk, adjacent to the street, one or two bidirectional etc.).	
3) **Location**: neighborhood, region, which is parallel to the track etc.	
4) **Date of construction**	
5) **Length**: Length of cycleway	
6) **Relief**: altimetry, slope and length of hills etc.	
7) **Organ builder and jurisdiction**: Body municipal or state that built and is responsible for maintenance of cycleway	
8) **Cost of work and resource**	
9) **Width and length of cycleway**: width and length segmented for purposes of technical analysis, according to its characteristics along its length	
10) **Type and size of the adjoining road**: street, avenue or highway, pavement type, width, etc.; characteristics of the adjacent sidewalk	
11) **Form of Segregation**: a barrier (wall, bed, blocks etc.) or delimitation (painting, bright studs etc)	
12) **Spacing**: distance between cycleway and the car road or walking	
13) **Speed of motorized traffic**: speed limit for motorized vehicles on the road and adjacent general traffic	
14) **Adequacy of tricycles**: width of cycleway for traffic of tricycles pedal	
15) **Support the increased demand**: considerations about the ability to absorb increased demand for cyclists	
16) **Quality of pavement**: pavement type used (asphalt, concrete, etc.) ; presence of ripples or roughness, adhesion, etc.	
17) **Integrity and conservation of the pavement**: the occurrence of maintenance, there are potholes, tree roots, crumbling pavement, cracks, etc.	
18) **Barriers**: the existence of poles, boards, garbage culverts, metal caps etc,	
19) **Ramps and gaps**: gap in cross section, slope, corners/bumps on the ramps up and down on driveways	
20) **Number of signs**: the quantity and distribution of signaling (paintings on the pavement, signs, traffic lights) for cyclists, motorists and pedestrians	
21) **Clarity of signs**: ease of understanding signaling by cyclists, motorists and pedestrians	
22) **Intersections**: the amount and type (clovers, bearings etc.), signage (signs and banners), granting priority to cyclists	
23) **Access and cross street**: quantity and quality of access points for cyclewaye; signs (tracks, traffic lights etc.). Cyclist to cross the street	

24) **Constancy of speed**: considerations about the possibility of cycling at constant speed in most of the cycleway	
25) **Number of stops**: number of intersections where the cyclist is obliged to stop the bike to give preference to other modalities	
26) **Accessed services**: business services (schools, health clinics, etc..), leisure and commerce accessed	
27) **Direct Route**: there are detours and unnecessary bends in the path	
28) **Share**: amount and quality of the structures where the cyclist shares the road with pedestrians and motorists (signaling, size, etc.	
29) **Network Connection**: Connection of the track cycling with other cycling routes forming a cycling network to follow up trip	
30) **Integration with public transport**: bus terminals accessed through the cycleway	
31) **Access to bicycle racks**: bicycle racks accessed by the cycleway	
32) **Drainage**: slope and drains rainwater; existence of puddles, ponds etc.	
33) **Accumulation of waste**: points of accumulation of clay, soil, waste or similar erosion in the bed of the cycleway	
34) **Lighting**: quality of artificial lighting along the cycleway	
35) **Afforestation**: number of trees planted along the cycleway to provide shade to the riders	
36) **Conflict with pedestrians**: the presence or absence (and quality) to ride so as to prevent pedestrians from walking on the cycling track	
37) **Entries in garages**: quantity and characteristics of driveways and parking lots into housing, shops, etc.	
38) **Compliance from motor drivers**: the presence of parked for motor vehicles, traveling on the road cycling, making loading and unloading etc.	
39) **Accessibility childhood**: considerations on the general conditions of use of the cycleway by children	
40) **Potential attractiveness**: considerations on the cycleway capability to attract new users of the bicycle	
41) **Feeling of security**: considerations about the general feeling of security when using the cycleway	
42) **Feeling of comfort**: considerations about the general feeling of comfort when using the cycleway	
43) **Date of collection of field**:	
44) **Name of the researcher**	
45) **Address URL**	