Standard requirements for bike paths, is it worth?

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October 2023

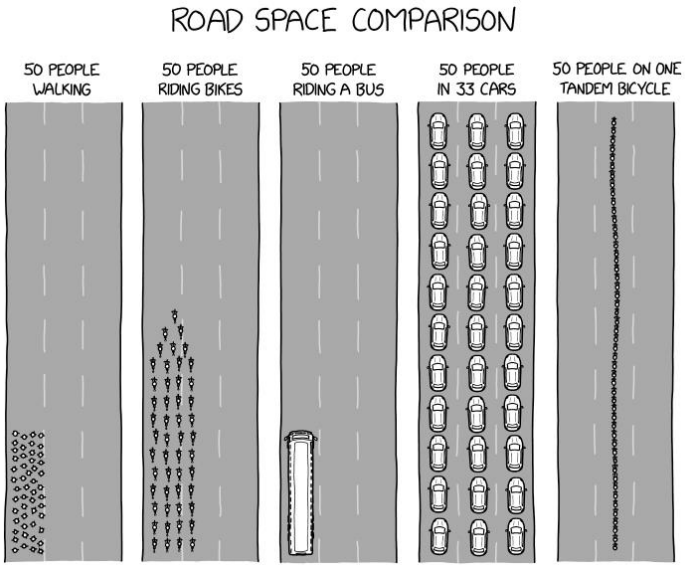
Kiwa KOAC B.V.

Trust
Quality
Progress

Summary

- The importance of cycling
- Overview on the current situation
- Do we need bike paths quality standards?
  - Focus on friction
- Conclusions

The importance of cycling



Benefit	Estimated Value (billion euros)
CO2 emissions savings	0.6 – 5.6
Reduction of air pollution	0.435
Reduction of noise pollution	0.3
Fuel savings	4.0
Longer and healthier lives	73
Less sickness absence at the workplace	5
Bicycle market	13,2
Cycle tourism	44
Easing of road congestion	6,8
Saving on construction and maintenance costs for road infrastructure for motorised vehicles	2,9
Total annual benefits	**150 - 155 bn euros**

Source: Steenberghen T. et al. 2017. Support study on data collection and analysis of active modes use and infrastructure in Europe

Space efficiency:

- 7 times more bikes than cars can cross a 3.5m-wide space
- 1 car park can fit 15 bikes

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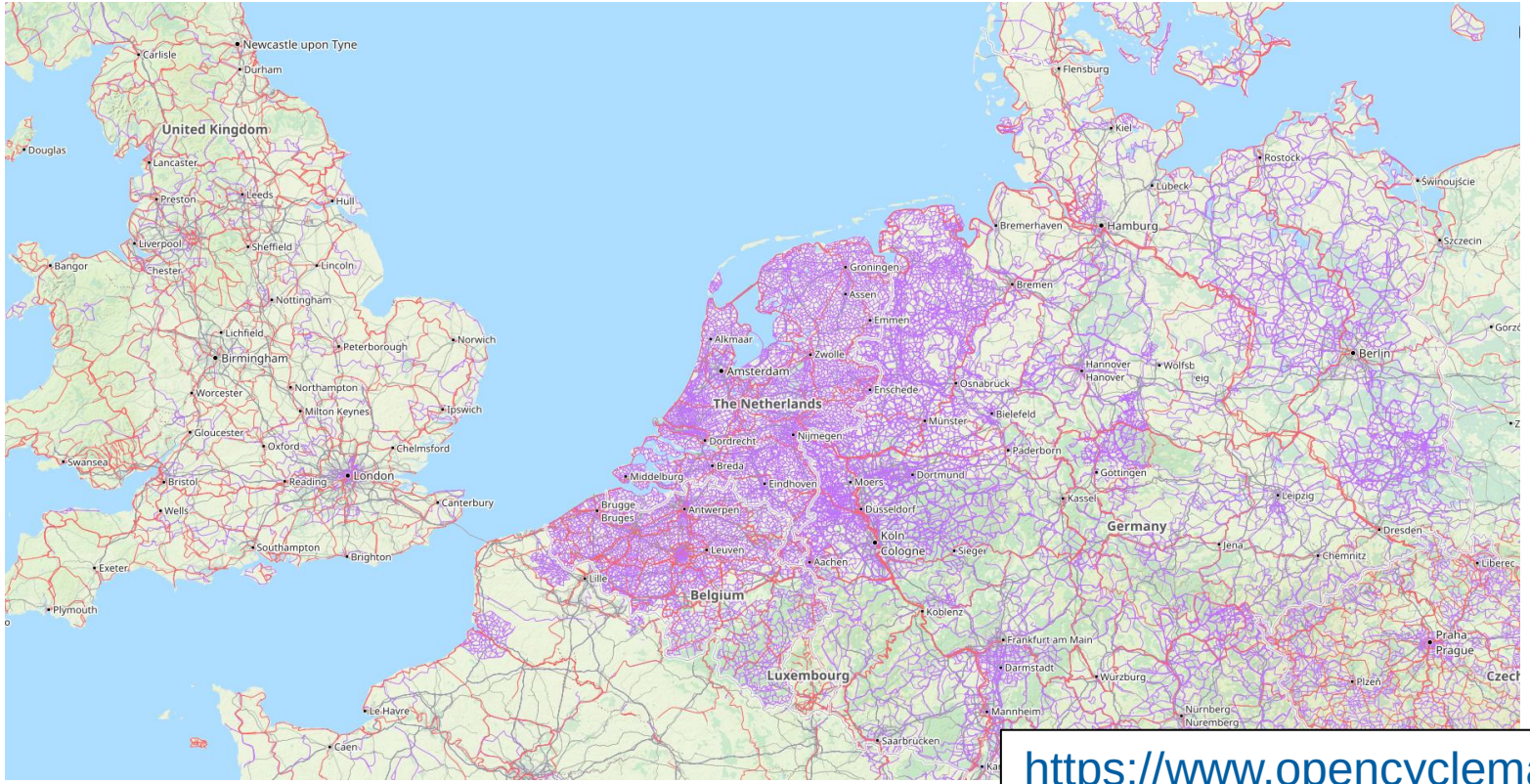
The importance of cycling



https://www.opencyclemap.org

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The importance of cycling

Many countries in Europe are trying to remove cars from the city areas.

- Infrastructures
- Bike sharing
- P+R

Company incentives to promote commuting by bike

Increased due to COVID-19

Cycling tourism as a sustainable way to travel!

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Current situation

Growing investments translate into the need for standards and quality regulations:

- Quality assessment;
- Maintenance planning;
- Safety!

The exact same approach we are currently using for roads!

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Current situation

Fietscomfortmetingen (NL):

- Comfort + Visual inspection
- Based on longitudinal profiles
- Vertical acceleration suffered from the user riding a bike

We saw many other examples;
Each country is developing their own standards

Comfort $\stackrel{?}{=}$ Safety?

Current situation

Different vehicles = different feelings,
different comfort!

Comfort $\stackrel{?}{=}$ Safety?

Speed pedelec

Speed pedelecs

A speed pedelec (or high-speed e-bike) is an electric bicycle with a maximum speed of 45 km/h. Due to the speeds they can reach, speed pedelecs are subject to the same regulations as mopeds. This means that a speed pedelec must be fitted with a moped registration plate in order to be able to use public roads, and the rider must have a moped driving licence.

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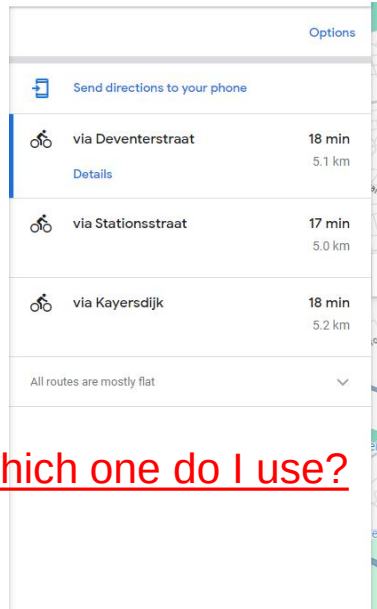
Current situation

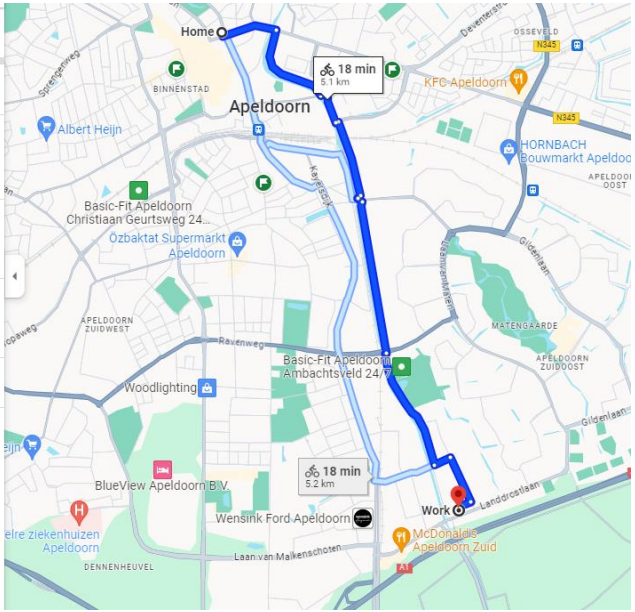
Different user perception and choice for the path:

- Mixed or separate
- Width
- Lighting
- Number of intersections
- Priority
- Cars nearby
- Directness
- Delays
- …

Many choices withing the same time/distance!



Which one do I use?



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Do we need bike paths quality standards?

Do bike paths look like roads?

They share similar distresses:

- Cracks;
- Raveling;
- Patching;
- Roughness;
- Rutting?

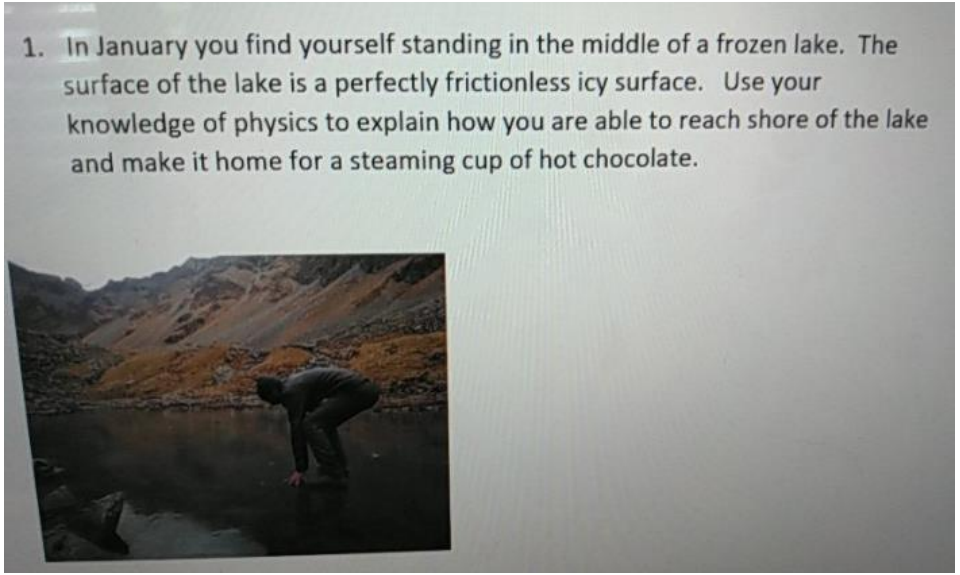
“Random” wheel paths

How about friction?
Friction is connected to safety!

Do we need friction?

YES

- It allows us to move/stop
- Directly connected to safety



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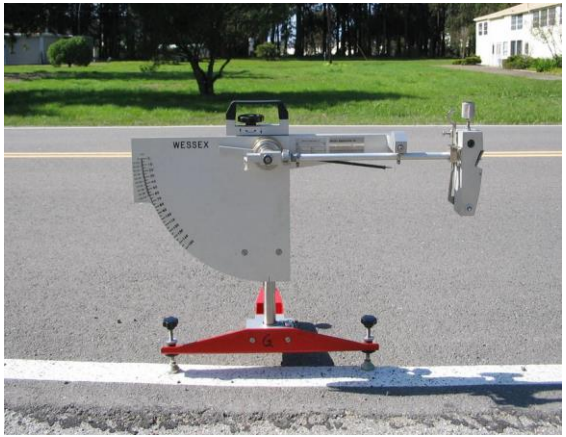
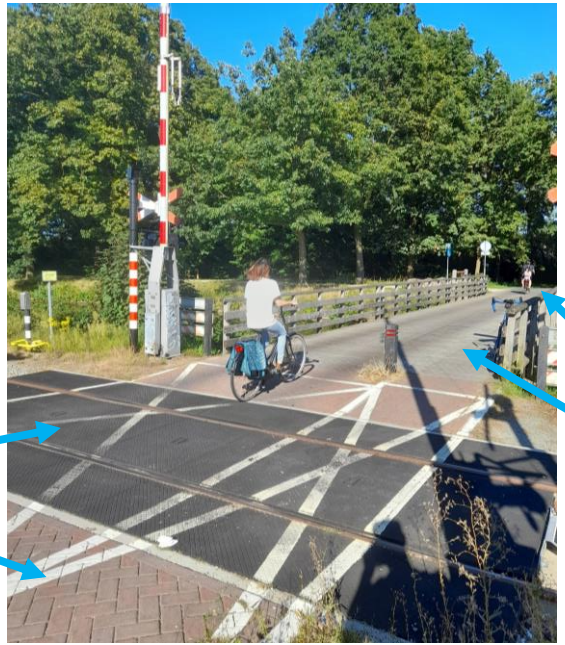
Do we need friction?

YES, but..

- Hard to measure
- A lot of different pavements
  - Single threshold for all surfaces?





Railroad crossing
Bricks

Asphalt
Wooden bridge

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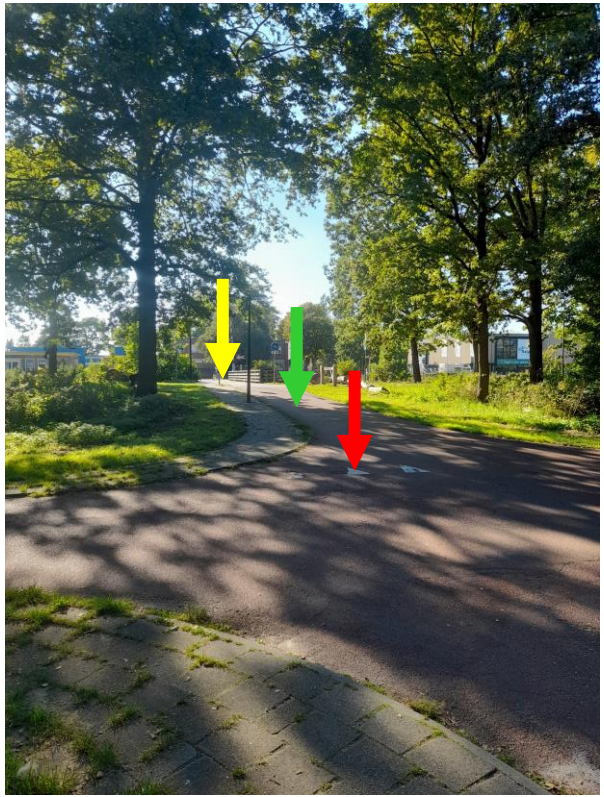
Do we need friction?

YES, but..

Worst spot on my bike path to the office:

- Wet wooden bridge
- Moisture (canal)
- Shadow
- Opposite slope

A little poor section is enough to cause a cyclist to fall!



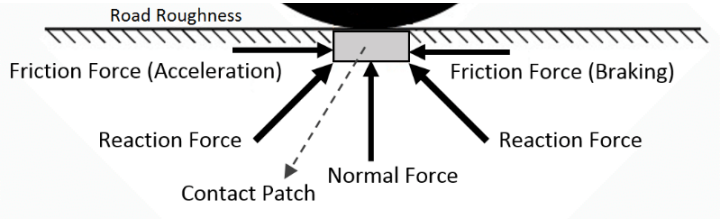
Where do we measure friction?

Very hard to replicate real conditions, either with lab or on field testing

Do we need friction?

We only discussed about one of the two main components of friction;

What happens if we have a look on the other side?



Tire properties:

- Minimum tread?
- Age?
- Pressure?

Breaking system efficiency? → Annual check for bikes?

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Conclusions

It is indeed nice that we're investing a lot in bike infrastructures, both inside and outside urban areas;

Many benefits (environment, health, space and mobility..)

We want to ensure quality and safety, this task comes with some consequences:

- Which parameter?
  - Comfort? Friction?
- Where/how do we measure it?
- One threshold for all surfaces?
- How about tires?

Perhaps it is better to focus on different parameters such as roughness or similar


Thank you!