Cycling and Safety Measures in Danish Road Standards

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SHA
BAZ


Copenhagen 1933


Aarhus 1934


Copenhagen 1953

Hi Cyclist - You are number 14276 today

Meter showing one direction only

Total volume > 30.000 bicycles AADT

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Planning and designing for bicycle traffic should be an integrated part of the road planning and design process

- not only for safety reasons but also regarding flow/capacity

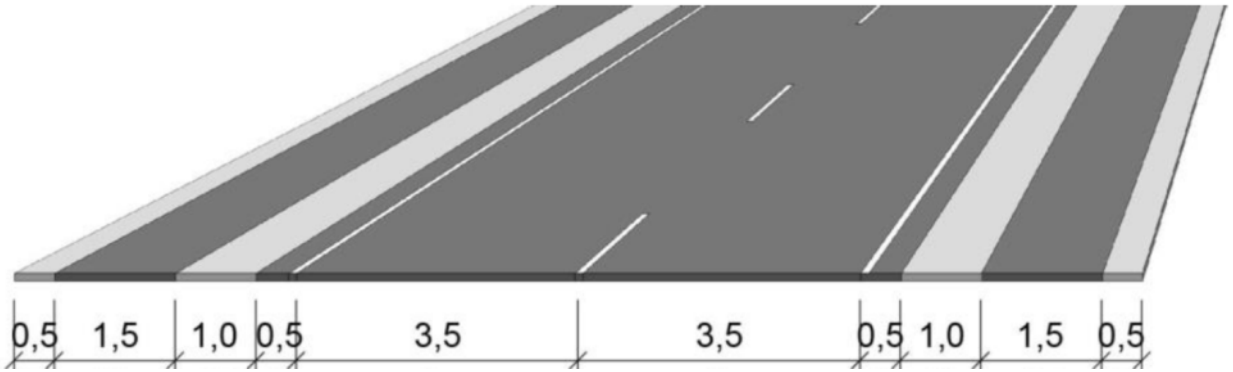
Danish Road Standards

All road authorities and all types of roads

Very few mandatory rules (mainly signing and marking)

Guidelines and Best Practice

Many standards available in English on:
http://english-vejregler.lovportaler.dk/



Example:

Basis cross section for two lane rural road with bicycle tracks (minimum width)

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Rural area – examples

Urban area – examples

Cycle Track Widths

Recommended width of one-way bicycle track in urban area:

2.25 m (1.8 m minimum)

If next to parking lane:

Add 0.1 m extra

New Danish study:

“Capacity and Behaviour on One-way Cycle Tracks of Different Widths”

Find it here:

www.trafitec.dk

Bicycle track with “buffer zone” towards parked cars

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Bicycle Tracks and Lanes – Safety Effects

Overall findings for urban areas:

- On **road sections**, the number of bicycle accidents **decreases**
- In **junctions**, the number of accidents **increases**
- Very little effect on the total number of accidents involving bicycles

Overall findings for rural areas:

- Results are much more positive for rural roads than for urban roads
- Best estimate: 50% accident reduction approx. (sections and junctions in total)

Main challenge is junction design in urban area!

Signalized Junctions

Recommended measures:

- Separate right turn lane for cars
- Advanced stop lines
- Blue bicycle crossings
- Designated traffic signals
- Truncated bicycle track

Advanced stop line with bicycle box

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Designated traffic signals

Separate stage for right turning cars against bicycles going straight ahead

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Truncated bicycle track

Recommended if no space for both bicycle track and separate right turn lane for cars.

On downhill grades often the safest solution.

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Truncated bicycle track

Works well when traffic volumes are moderate.

Difficult for right turning cars to merge into the right turn lane when bicycle flows are intense.

Separation or Integration?

Speed as the key factor

- If speed limit is 60 km/h or more: separation
- If speed limit is 30 km/h or lower: integration
- If speed limit is 40 or 50 km/h: depends on accident pattern, traffic volumes, number of junctions

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“2 minus 1”

Both rural and urban areas

Speed limits
- urban area max. 50 km/h
- rural area max. 60 km/h
  (sign posted in rural area)

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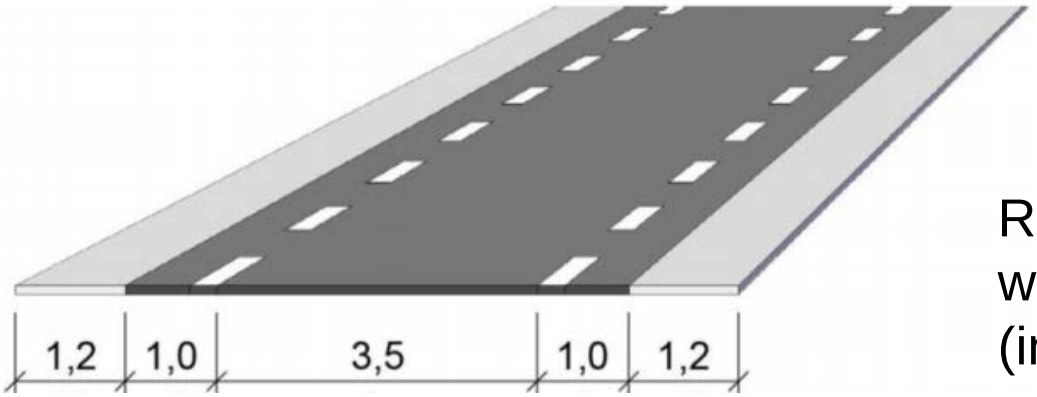
“2 minus 1” – design

Driving lane width: 3,0 - 3,5 meter

Hard strip width: 0,9 meter minimum (incl. edge line)

Edge line width: 0,3 meter (broken line)

Recommended basis cross section



Recommended hard strip width: 1,5 meter maximum (incl. edge line)

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Two-directional bicycle paths

When bicycles have the right of way, car drivers from the side road often forget to look for bicycles from the “wrong” direction.

Possible measure: Bicycles to yield when crossing side road

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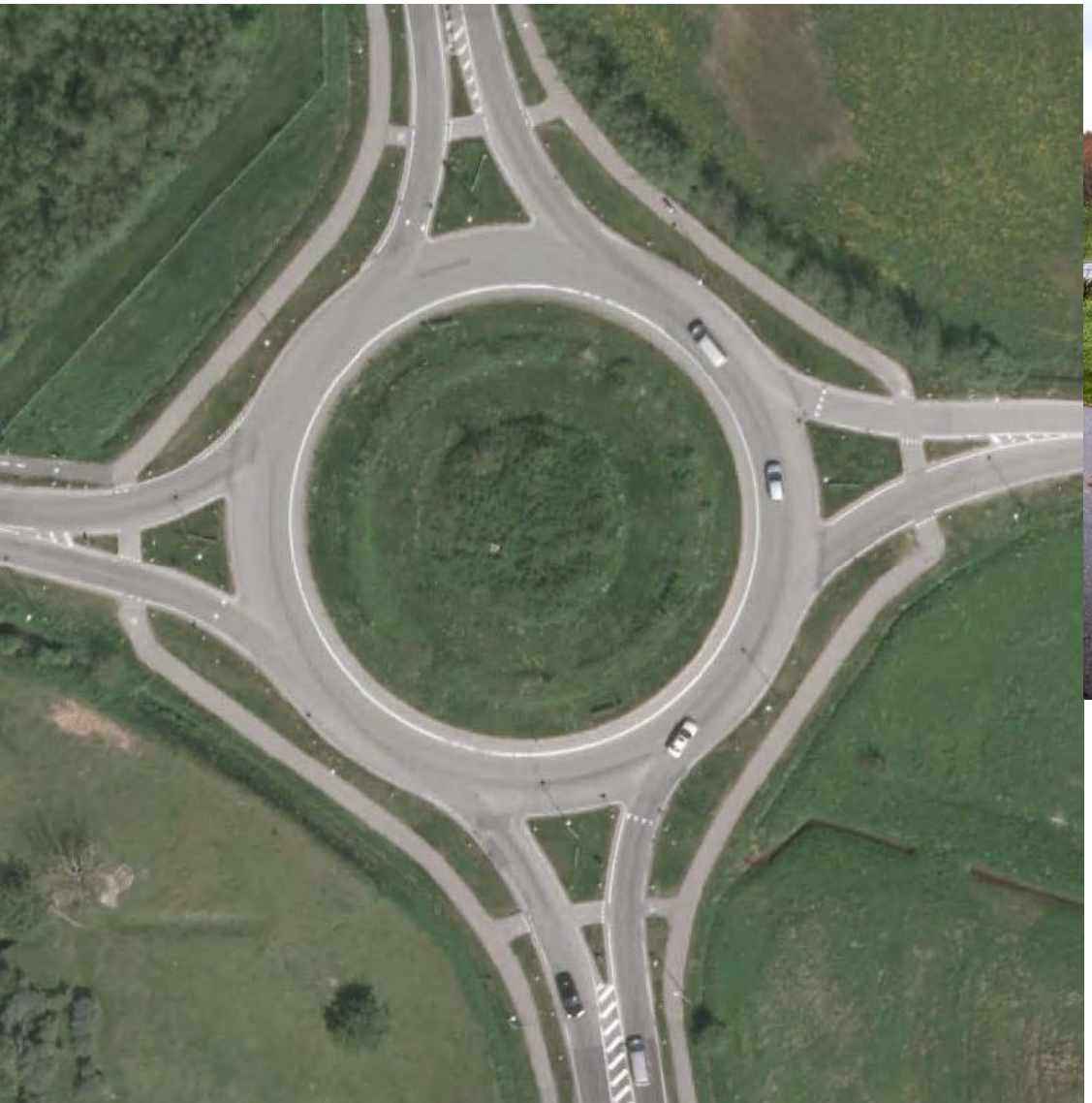
Also in roundabouts

- bicycles to yield when crossing exits and entrances to roundabout



Recommended in rural area roundabouts (and in urban area if possible)

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Thank you for your attention!

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