THE WORLD OF WINTER CYCLING

Timo Perälä 28.01.2015
Winter Cities Shake Up, Edmonton
Jari Kurri  Jari Kurri  Jari Kurri  Jari Kurri  Jari Kurri
Esa Tikkanen Esa Tikkanen Esa Tikkanen Esa Tikkanen Esa Tikkanen
Reijo Ruotsalainen Reijo Ruotsalainen
• MSc IN CIVIL ENGINEERING (2000)

• FOUNDER AND CHAIRMAN OF THE WINTER CYCLING FEDERATION (WCF)

• CEO AT NAVICO LTD.

• CYCLING COORDINATOR FOR THE CITY OF OULU (2013 -> )

• MEMBER OF THE FINNISH CYCLING EMBASSY

• BASED IN OULU, FINLAND

* Photo: Anu Perala

Maintenance quality requirements for pedestrian and cycle paths and single accidents among pedestrians and cyclists, 2000
National winter cycling study, 2002

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WINTER CYCLING FOR EVERYONE

Photo: Pekka Tahkola, WCF
WWW.WINTERCYCLING.ORG

WINTER CYCLING DATABANK

WINTER CYCLING MANUAL

WINTER CYCLING BAROMETER

Project starts 02/2015

First survey in 03/2015
1. Vocabulary and definitions
   1. In order to discuss and share knowledge we should be able to talk about the same things...

2. The world of winter cycling
   1. Winter cycling and winter cycling characteristics in different parts of the world
   2. Winter cycling statistics

3. Winter cycling in land use planning
   1. How to make the space for winter cycling
   2. Snow storage planning in land use planning

4. Winter cycling and street design
   1. Winter cycling and cross section
   2. What is important in street design for winter cycling?

5. Winter maintenance of cycling routes
   1. Winter maintenance policies
   2. Different winter conditions require different maintenance methods
   3. Winter cycling and maintenance contracts
   4. Quality requirements for cycling route's winter maintenance
   5. Winter maintenance equipment and winter cycling
   6. Winter maintenance materials and winter cycling
   7. Maintenance control, bonuses and sanctions
   8. ITS in maintenance of cycle routes

6. Bicycle parking in winter
   1. Bicycle parking during winter, what to take into consideration?
   2. Bicycle parking planning, the winter aspect
   3. Best models and solutions
   4. Bicycle parking winter maintenance

7. Counting in the cold
   1. How to measure winter cycling?
   2. Light traffic surveys for winter time
   3. Bicycle traffic counts
   4. Citizens participation

8. Winter cycling mobility management
   1. How to boost winter cycling in your city?
   2. Winter cycling campaigns

9. Winter cycling gear
   1. The bike in winter (best winter bikes, ebikes, cargo bikes, trailers in winter, fatbikes, etc.)
   2. The people (how to prepare for winter cycling in different winter conditions)
   3. Other stuff
   4. Fancy stuff

10. Winter cycling success stories
    1. City / country examples
BECOME A MEMBER OF WINTER CYCLING CITIES

www.wintercycling.org/membership
3,85 BILLION PEOPLE (55 %) HAVE EXPERIENCED SNOW

THEY ALL HAVE TO GO SOMEWHERE...
CAIRO HAD SNOW FOR THE FIRST TIME IN 112 YEARS
CYCLING IN WINTER AROUND THE WORLD?

Photo: Utrecht, Netherlands, Mobycon
WHERE?

1. = MASTERS  
   Sweden, Finland, Denmark, Netherlands

2. = CLIMBERS  
   Norway, Austria, Switzerland, Germany...

3. = NOVICES  
   Canada, USA, Russia, Poland, France...

4. = MYSTERIES  
   China, Japan
# Top Ten Winter Cycling Cities

- Points were given from 1-7 in each category, then multiplied by the coefficients
- Cities over 50,000 inhabitants were taken into consideration
- Approximately 60 cities from 12 countries studied more closely

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>City</th>
<th>Cycling mode split</th>
<th>Winter cycling share</th>
<th>Cycling network / inhab.</th>
<th>Average thermal winter length + snow days (sum)</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Finland</td>
<td>Oulu</td>
<td>22 %</td>
<td>33 %**</td>
<td>4.3 m</td>
<td>256</td>
<td>27.5</td>
</tr>
<tr>
<td>2.</td>
<td>Sweden</td>
<td>Linköping</td>
<td>30 %</td>
<td>40 %*</td>
<td>3.4 m</td>
<td>147</td>
<td>27.0</td>
</tr>
<tr>
<td>3.</td>
<td>Sweden</td>
<td>Uppsala</td>
<td>28 %</td>
<td>41 %*</td>
<td>2.7 m</td>
<td>165</td>
<td>25.9</td>
</tr>
<tr>
<td>4.</td>
<td>Sweden</td>
<td>Umeå</td>
<td>22 %</td>
<td>37 %*</td>
<td>2.8 m</td>
<td>225</td>
<td>25.7</td>
</tr>
<tr>
<td>5.</td>
<td>Sweden</td>
<td>Örebro</td>
<td>28 %</td>
<td>51 %**</td>
<td>1.6 m</td>
<td>145</td>
<td>24.9</td>
</tr>
<tr>
<td>6.</td>
<td>Finland</td>
<td>Joensuu</td>
<td><strong>32 %</strong></td>
<td>19 %**</td>
<td>3.9 m</td>
<td>281</td>
<td>24.6</td>
</tr>
<tr>
<td>7.</td>
<td>Sweden</td>
<td>Karlstad</td>
<td>18 %</td>
<td>50 %*</td>
<td>2.8 m</td>
<td>177</td>
<td>23.3</td>
</tr>
<tr>
<td>8.</td>
<td>Sweden</td>
<td>Rovaniemi</td>
<td>12 %</td>
<td>28 %**</td>
<td>2.0 m</td>
<td><strong>321</strong></td>
<td>22.6</td>
</tr>
<tr>
<td>9.</td>
<td>Finland</td>
<td>Jyväskylä</td>
<td>13 %</td>
<td>20 %*</td>
<td>3.5 m</td>
<td>270</td>
<td>20.9</td>
</tr>
<tr>
<td>10.</td>
<td>Sweden</td>
<td>Luleå</td>
<td>10 %</td>
<td>24 %*</td>
<td>1.7 m</td>
<td>249</td>
<td>18.9</td>
</tr>
</tbody>
</table>

* Data from city webpages / surveys / questionnaires
** Winter cycling share counted from automatic bike counters

Perälä, 2013
COPENHAGEN, DENMARK

Photo: gehlcitiesforpeople.dk
OU LU, FINLAND

Photo: Jukka Talvi, City of Oulu
282 specific grade-separated crossings just for cyclists and pedestrians
Photo: Robert Thomson
WHO THE ☃️ 🌧️ ❄️ RIDES A BIKE IN WINTER?
2. THE IMAGE...

FACE IT, DAD. THE SEASON'S OVER.

ARE YOU KIDDING? IN THIS STUFF, I REACH MY OPTIMAL HEART RATE IN NO TIME!
"The average winter cyclist in Calgary is a middle-aged man who rides almost every day, usually to work, and will brave temperatures down to -20°C and colder to do so.

Sadeghpour, Babin
2. ITS A BIT DIFFERENT OUT THERE...

Table: Oulu regional traffic survey 2009

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>Others</th>
<th>Non-cyclists</th>
<th>Infrequent cyclists</th>
<th>Active summer cyclist, never on winter time</th>
<th>Active summer cyclist, infrequent winter cyclist</th>
<th>Active cyclist all year round</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 to 12</td>
<td>male</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>13 to 17</td>
<td>female</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>18 to 22</td>
<td>male</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>23 to 27</td>
<td>female</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>28 to 32</td>
<td>male</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>33 to 37</td>
<td>female</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>38 to 42</td>
<td>male</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>43 to 47</td>
<td>female</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>48 to 52</td>
<td>male</td>
<td>40%</td>
<td>40%</td>
<td>40%</td>
<td>40%</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>53 to 57</td>
<td>female</td>
<td>40%</td>
<td>40%</td>
<td>40%</td>
<td>40%</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>58 to 62</td>
<td>male</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>63 to 67</td>
<td>female</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>68 to 72</td>
<td>male</td>
<td>60%</td>
<td>60%</td>
<td>60%</td>
<td>60%</td>
<td>60%</td>
<td>60%</td>
</tr>
<tr>
<td>73 to 77</td>
<td>female</td>
<td>60%</td>
<td>60%</td>
<td>60%</td>
<td>60%</td>
<td>60%</td>
<td>60%</td>
</tr>
<tr>
<td>78 to 82</td>
<td>male</td>
<td>70%</td>
<td>70%</td>
<td>70%</td>
<td>70%</td>
<td>70%</td>
<td>70%</td>
</tr>
<tr>
<td>83 to 87</td>
<td>female</td>
<td>70%</td>
<td>70%</td>
<td>70%</td>
<td>70%</td>
<td>70%</td>
<td>70%</td>
</tr>
<tr>
<td>88+</td>
<td>male</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>89+</td>
<td>female</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
</tbody>
</table>

Photo: Timo Perälä
2. OLD.....

Photos: Timo Perälä
AND YOUNG...
CONVENIENCE 50%
The easiest, fastest, cheapest mode of transportation

EXERCISE 25%

Finnish national winter cycling survey, 2002 (n=2,500 winter cyclists)
3. **WHY PEOPLE CYCLE IN WINTER?**

**PART OF COMMUTING** 56%

**EXERCISE & RECREATION**

Winter Cyclists Survey, Calgary, Sadeghpour, 2013 (n=2100 cyclists)

Photo: www.velo-urbanism.com
4. WHY PEOPLE STOP CYCLING...

- COLD: 32%
- SLIPPERY: 23%
- DANGEROUS: 15%

Photo: Timo Perälä

Finnish national winter cycling survey, 2002 (n=1300, summer cyclists)
4. BIGGEST SAFETY CONCERNS

ICE & SNOW 30%
LANE WIDTH
POOR PAVEMENT

Winter Cyclists Survey, Calgary, Sadeghpour, 2013
(n=2100 cyclists)
Accidents leading to injury / 1000 cyclists (Data from the city of Oulu)
5. WINTER CYCLING SAFETY

**Accident type distribution**

- Motor vehicle: 18%
- Cyclists: 6%
- Other: 3%
- Moped: 1%
- Pedestrian: 1%
- Single: 71%

**Accident cause of single bicycle accidents**

<table>
<thead>
<tr>
<th>Cause</th>
<th>All injured</th>
<th>Seriously injured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance and operation</td>
<td>17%</td>
<td>27%</td>
</tr>
<tr>
<td>• Slipperiness (ice, grit, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Uneven road surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Loose objects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Sharp/high road edges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System design</td>
<td>12%</td>
<td>20%</td>
</tr>
<tr>
<td>• Curb stone, Firm objects, Tram rails</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bicycle - Cyclist</td>
<td>17%</td>
<td>27%</td>
</tr>
<tr>
<td>• On/off, Bicycle failure, Brakes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyclist behaviour</td>
<td>9%</td>
<td>15%</td>
</tr>
<tr>
<td>• High speed, Alcohol, Playing, Own dog</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction with other road users</td>
<td>6%</td>
<td>11%</td>
</tr>
<tr>
<td>• Avoiding conflicts, Dogs, Animals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>39%</td>
<td></td>
</tr>
</tbody>
</table>

Seriously injured cyclists in Sweden (n=775), Swedish hospital data, STRADA, 2007-2011
Problems in winter maintenance

- Disordered network of cycle routes
- Non-homogeneous cycle routes
- Too little space for snow storage
- Expensive snow removal
- Attitude of maintenance staff
- Expertise of maintenance staff
- Unsuitable equipment
- Unsuitable methods
- Modest quality requirements
- Lack of money
- Etc.
SNOW LOGISTICS IS EXPENSIVE

Photo: Kalle Vaismaa, Verne
Pay attention to:

- Maximum transportation trip is 200 metres in average
- Topography
- Glacier water
- Ground bearing capacity
- Groundwater areas

Areal planning!

Oulu, Finland

Photo: Kalle Vaismaa, Verne
Case: Montreal

- Based on Decision Support System (DSS)

60 sectors

20 snow disposal places
6. SNOW HOW
6. BAD CROSS SECTION
6. CYCLING LANES IN WINTER

Photo: Winnipegcyclechick.com
6. PROTECTED CYCLING LANES

Photo: Tom Thivener
7. DO IT RIGHT, THEN MAINTAIN IT RIGHT!

Photo: Eltis.org
7. IF YOU BUILD IT, MAINTAIN IT

95 – 100 % MAINTAINED
7. IF YOU BUILD IT, MAINTAIN IT
100 km of prioritized network of 560 km

7. 1 cm, 4 hours, 100 times/winter
7. IMPORTANCE OF MAINTENANCE

-60 %

-40 %

Photo by Hans Moor
7. BIKE PARKING MAINTENANCE

Photo: Timo Perälä
COLDNESS HAS NOTHING TO DO WITH IT
WINTER CYCLING SHARE

- **Oulu at present**: 33%
- **Copenhagen level**: 80%
- **Finland national average**: 9%

**MAINTENANCE BUDGET** ~2,0 M€

**WINTER CYCLING BENEFITS THE CITIES**

Photo: Pekka Tahkola

+6,1 M€/y

-2,8 M€/y
9. WINTER CYCLING GEAR
Winter cycling

All you fair-weather bike-riding pinkos! Stop being such wimps. Just because there's snow on the ground and Don Cherry is teasing you doesn't mean you have to give up cycling until the spring. Get some spandex from your local lycra co-op, slap on a few more flashing lights, borrow a balaclava from an anarchist friend and you're good to go.

Wind-resistant or waterproof jacket with reflective markings or fluorescent safety vest

"Wicking" tights layered underneath

Water-resistant pants

Battery-powered light

Saddlebags (paniers) with reflective cover

Rear reflector

Enclosed chain and gears

Reflector on pedals

Battery-powered lights (front and back)

Helmet

Balaclava or facemask

Pink button to show your true colour

Ski goggles (for days with blowing snow)

"Lobster claw" gloves

Battery-powered light

Front and back fenders

Metal studded tires (optional)

Reflectors

Shoe covers or booties, and athletic wool socks

Picture: www.toronto.ca
So! You want to cycle in the winter?

| Wardrobe of regular clothes - includes winterwear | € varies |
| Gear for winter cycling: |   |
| Longsleeve merino sweater | € 75 |
| Kneewarmers | € 25 |
| Glasses | € 20 |
| Short sleeve merino vest | € 75 |
| Windproof fleece | € 110 |
| Waterproof cycling boots | € 230 |
| Cycling socks | € 15 |
| Cycling shorts | € 75 |
| Cycling cap | € 20 |
| Cycling gloves for winter | € 60 |
| Helmet | € 150 |
| Buff | € 15 |
| BIKE LOVE, BABY!!! | free |
| Total | € 870 |

Fancy bike customised for ‘winter use’ not calculated.

| Wardrobe of regular clothes - includes winterwear | € varies |
| Clothes for winter cycling: |   |
| Total | € 0 |

Regular bike (in garage/bought at flea market) not calculated.

Source: www.copenhagenize.com
MEANWHILE

IN FINLAND

Photo: Memeful.com