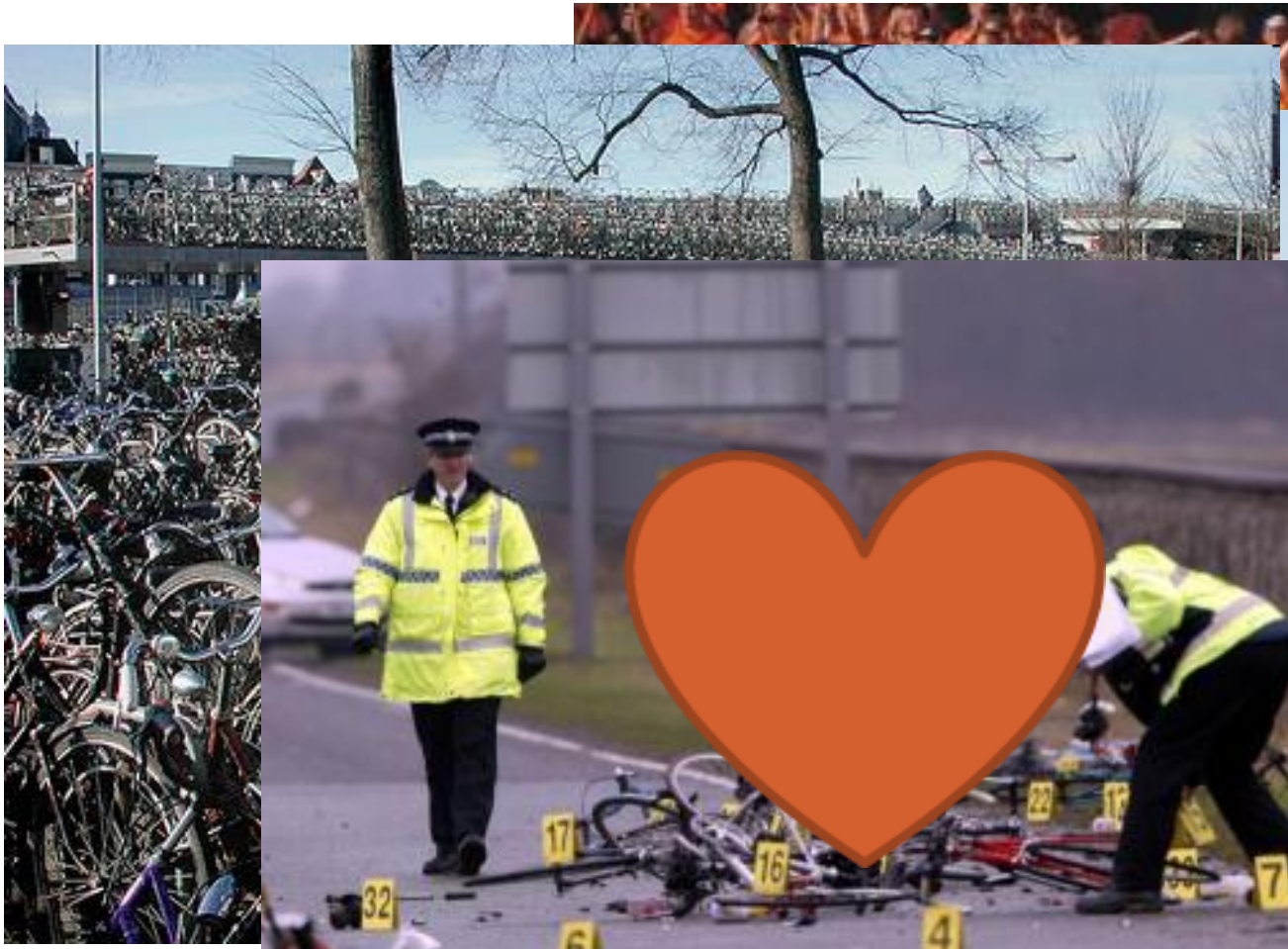
Typically Dutch!



Cycling in a sustainably safe system

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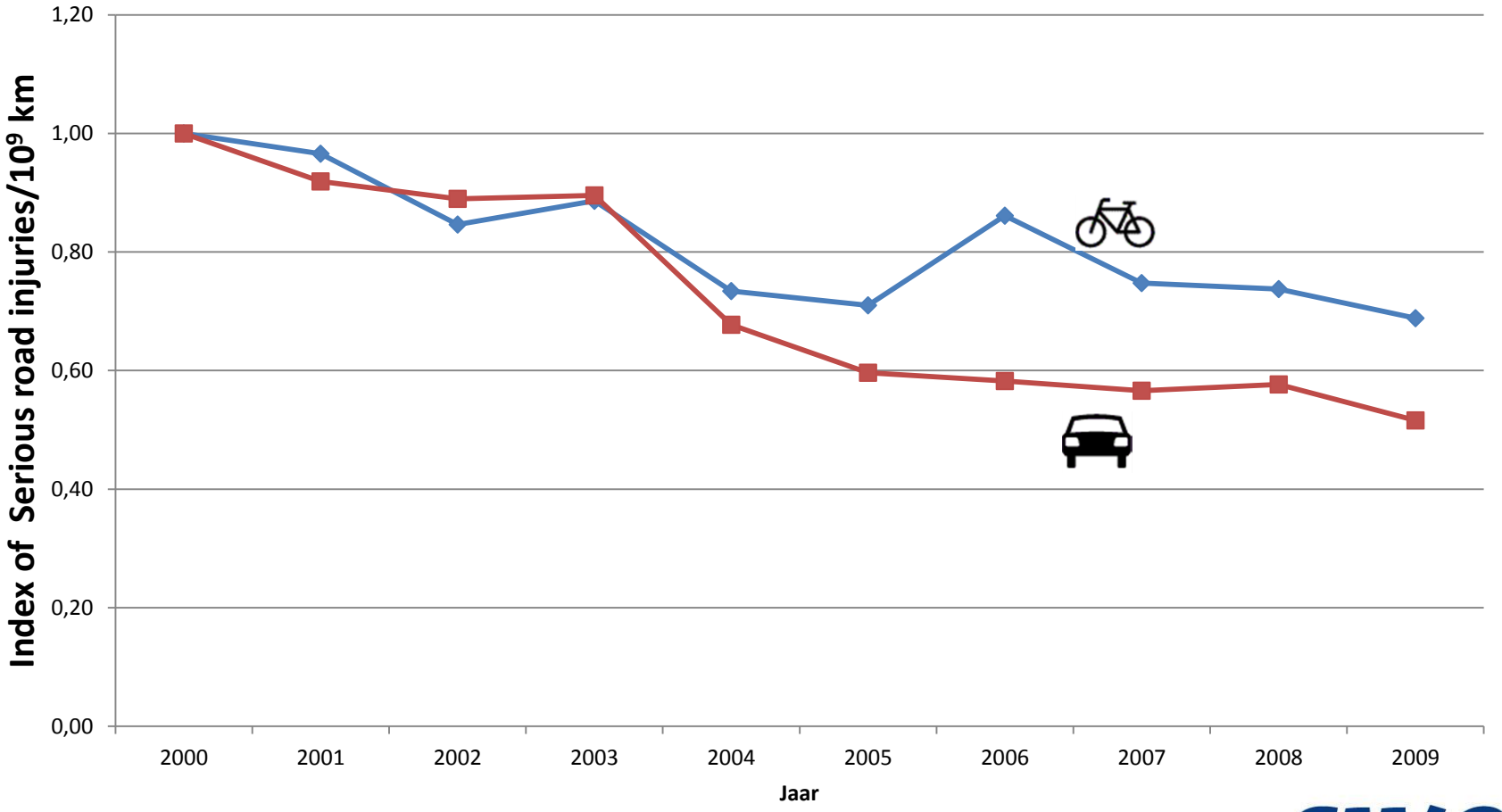
SWOV
WETENSCHAPPELIJK ONDERZOEK VERKEERSVEILIGHEID

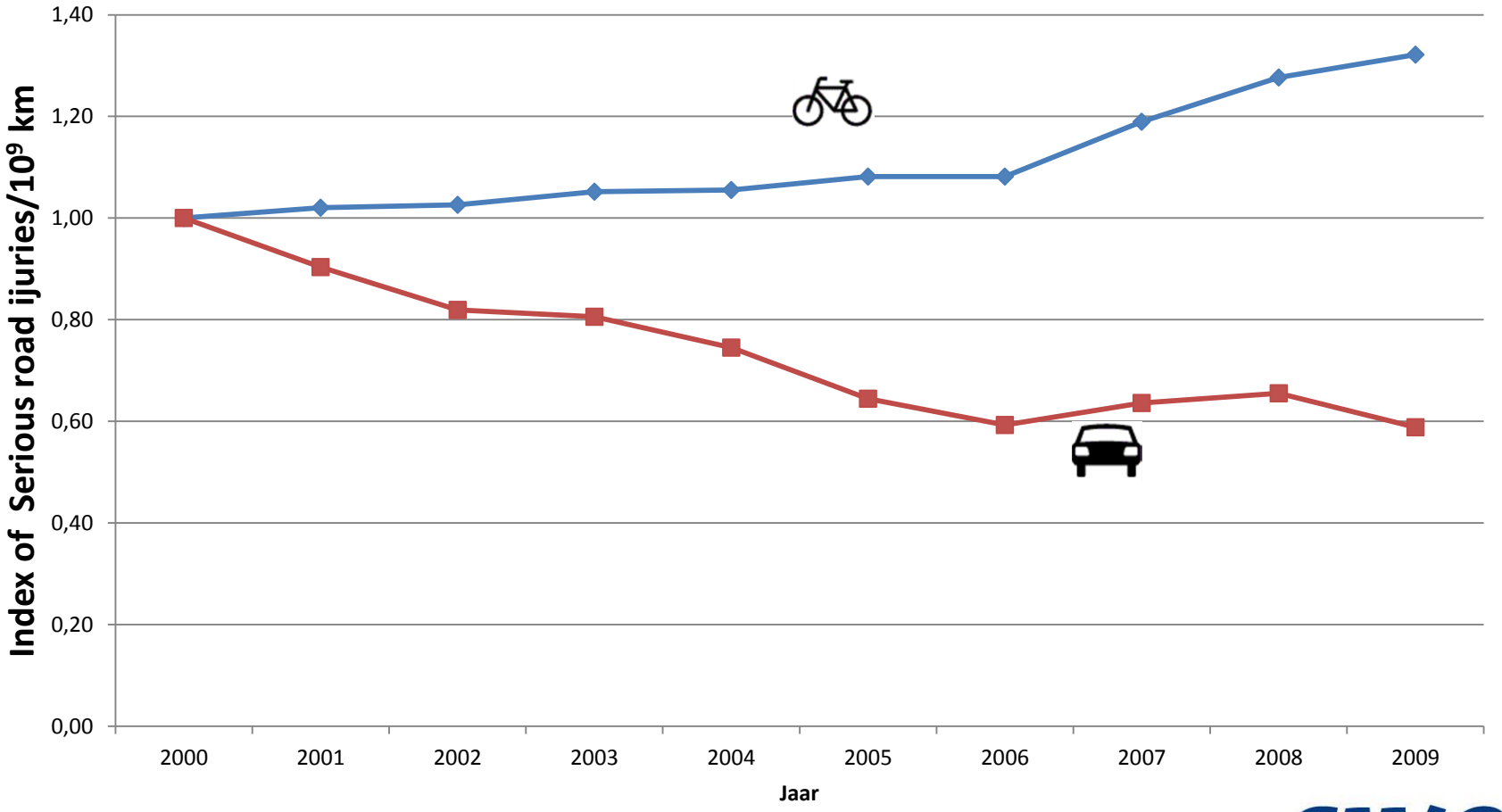
PROBLEM (DO NOT COPY)

Index road fatalities



SWOV
WETENSCHAPPELIJK ONDERZOEK VERKEERSVEILIGHEID

Index seriously injured road users



SWOV
WETENSCHAPPELIJK ONDERZOEK VERKEERSVEILIGHEID

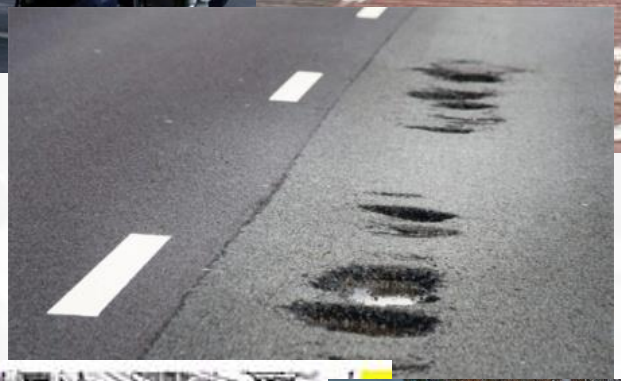
Fatalities: mostly because of motorized traffic

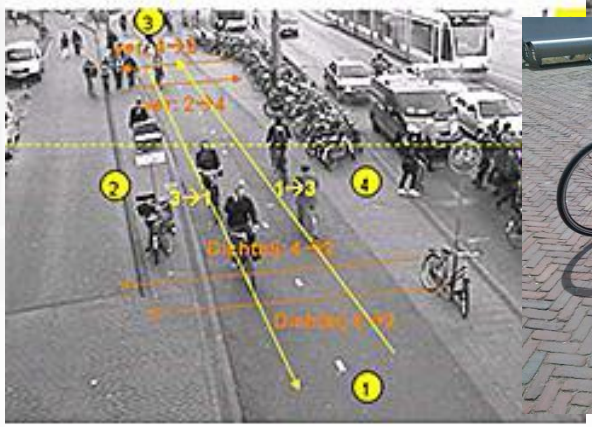
Crashes VRU & cars

- Mostly serious
- Happen mostly in built up areas
- Often at intersections

Serious Injuries: mostly because of falls

- Senior cyclists
- Poor infrastructural design
- Poor maintenance
- Cycle lanes that are too busy.
- Electric bicycles
- Alcohol use among cyclists





Sustainable safety (safe systems approach)

Integrated

- Education
- Infrastructure
- Vehicle design
- Enforcement

Proactive not curative

- Functionality
- Homogeneity speed/ mass direction
- Predictable course, presence and recognizable
- Forgiving environment/ users
- State awareness road user

System approach: Safe speeds*

Conflict types	Safe speed (km/h)
Possible conflicts Cars unprotected road users	**30**
Intersections conflicts right angles between cars	**50**
Possible frontal conflicts cars	**70**
No frontal and lateral conflicts	**100**

*** Tingvall, C. & Haworth, N. (1999). Vision zero - an ethical approach to safety and mobility. In: 6th ITE International Conference Road Safety & Traffic Enforcement: Beyond 2000.**

Thus ……

- Make man the measure of all things
- Use human factors/ cognitive ergonomics/ physical tolerance to design the systems.
- Bend the tool, not the person
- Make system forgiving for human (fatal) errors
- Change environment instead of man

Infrastructure Measures that work

Segregation of VRU and Motor vehicles

- Mix only at low speeds
- Else separate

- 30 Zones - 15 %
- Cycle path - 24 %
- 60 Zones - 32 %*
- Roundabout - 30 %*

An example of a safe road (30km/h)

Bicycles measures

- Bicycle Lights: ??
- Reflection on tyres: 4%
- Helmets: debate
- Reflection front: 4%
- Crash pants?

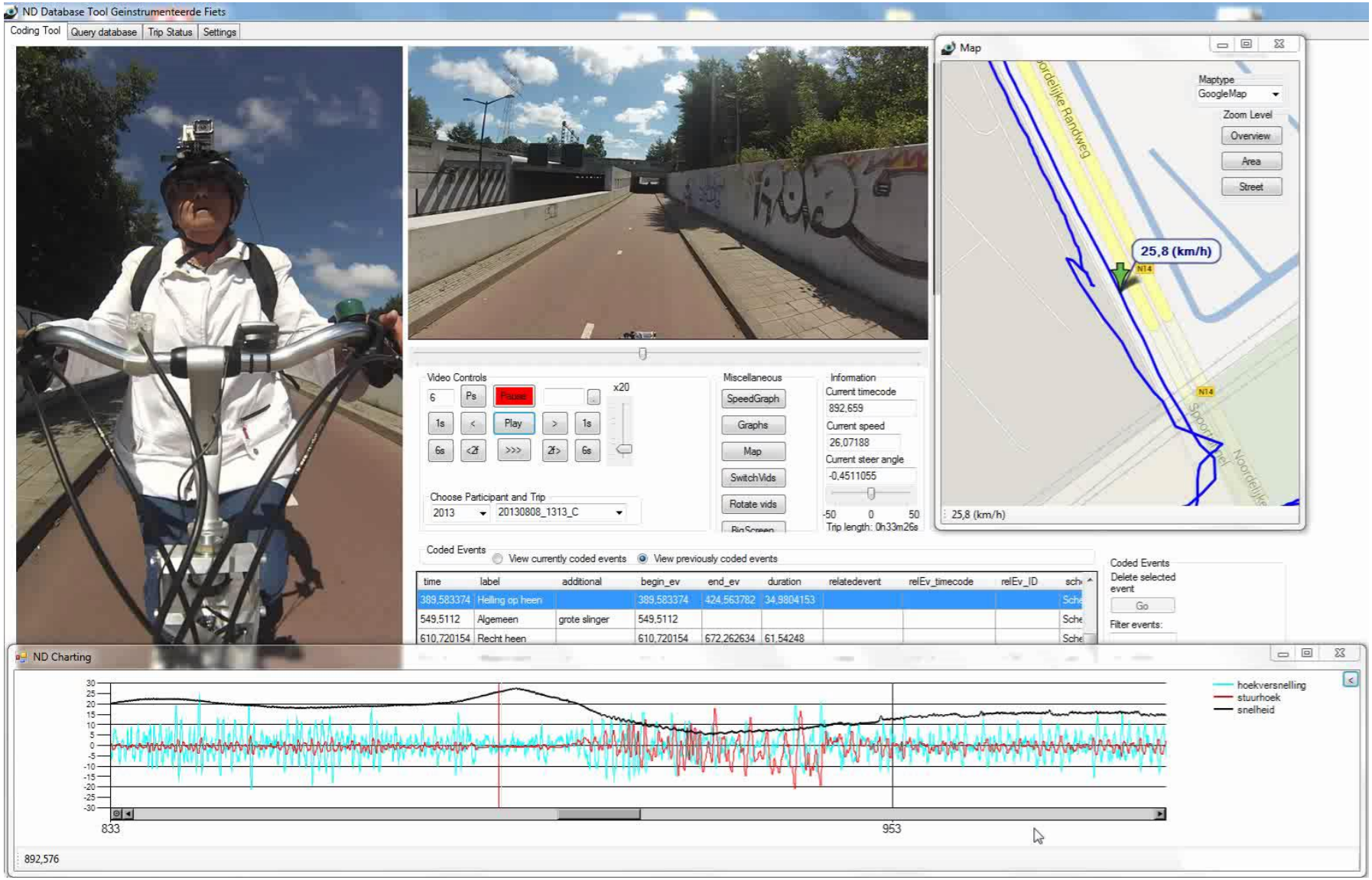
Enforcement

- Bicycle Lights
- Alcohol use drivers/ cyclists
- Speeding
- Red light running?

Bicycle innovation: Balance Bike

- Arend Schwab et al, TU Delft

Bicycle innovation: Instrumented bicycles


ND Database Tool Geinstrumenteerde Fiets
Coding Tool
Query database
Trip Status
Settings
Map
Maptype
GoogleMap
Zoom Level
Overview
Area
Street
25,8 (km/h)
Noordelijke Randweg
Video Controls
Pause
Play
x20
Miscellaneous
SpeedGraph
Graphs
Map
SwitchVids
Rotate vids
Information
Current timecode
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Current speed
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Current steer angle
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Trip length: 0h33m26s
Choose Participant and Trip
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Coded Events
View currently coded events
View previously coded events
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Delete selected event
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953
892,576

Conclusions

1. Cycling is healthy but unsafe
2. Just as car safety, bicycle safety is a multiple problem
3. Plenty of effective measures
4. Implementation is the problem
5. Innovations

But most importantly ……..

LOVE CYCLING