

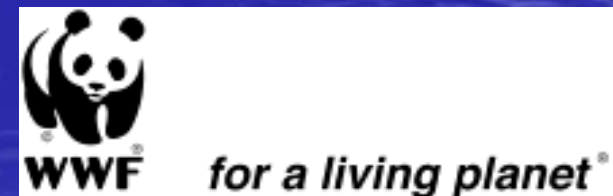
**Towards Carfree Cities Conference IX**  
**"How do We Get There?"**  
**York, England, 28 June to 1 July 2010**



## Sharing Cycling Best Practice

# Improving cycling mobility in hilly cities with folding bikes

Massimiliano Amirfeiz  
WWF Liguria  
World Car Free Network



# Topics

- My hometown Genova
- Genova ... a sky resort?
- Why folding bikes help
- The definitive “last mile” solution
- Folding vs E-bikes
- Trials and lesson learned
- Conclusions

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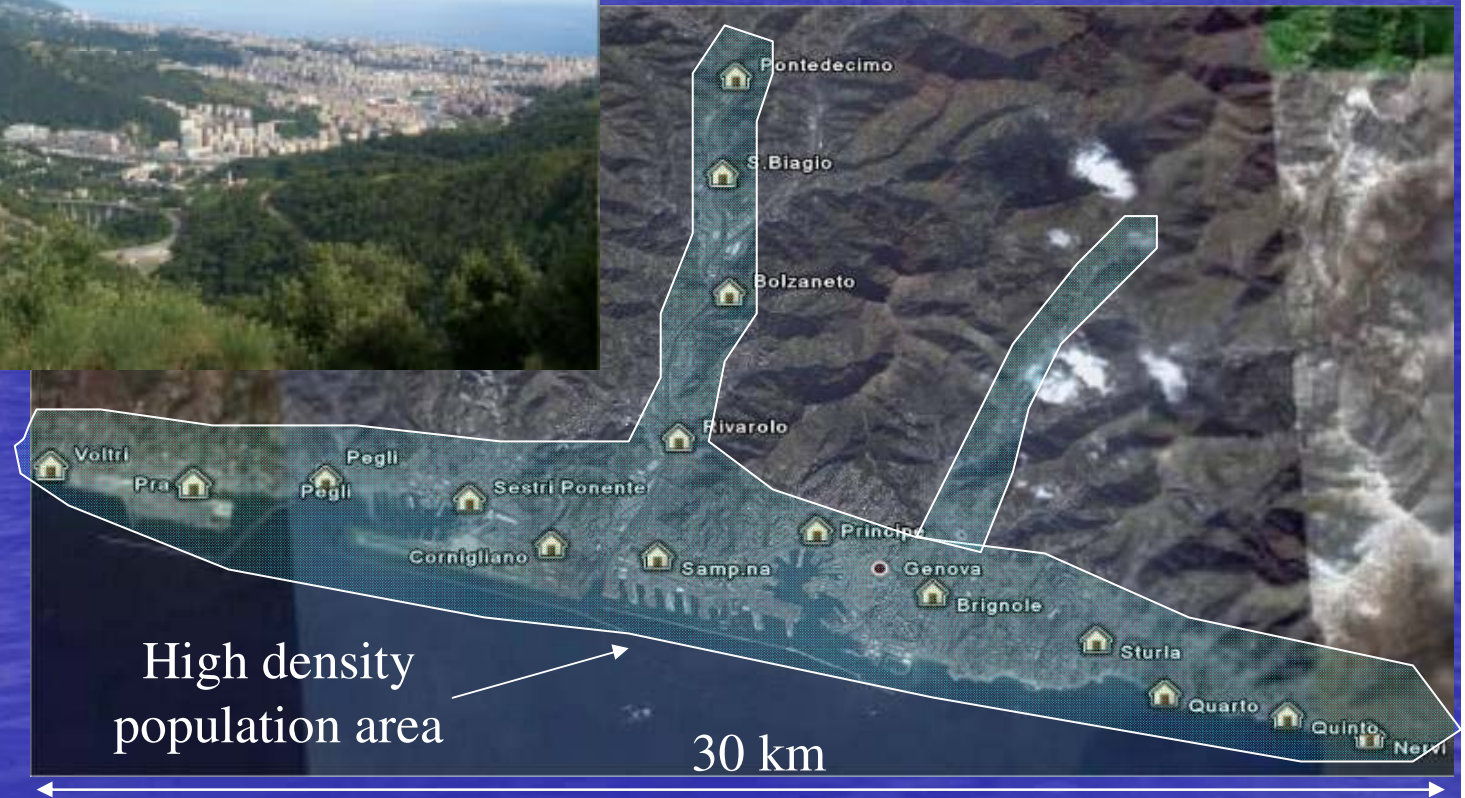
# Where is Genoa?



My hometown Genoa

a narrow strip of land between mountains and sea

My hometown Genova





# Genova is hilly

-  >80m level
-  Sea to 80m level
-  Sea level



Courtesy of G. Ceccarelli

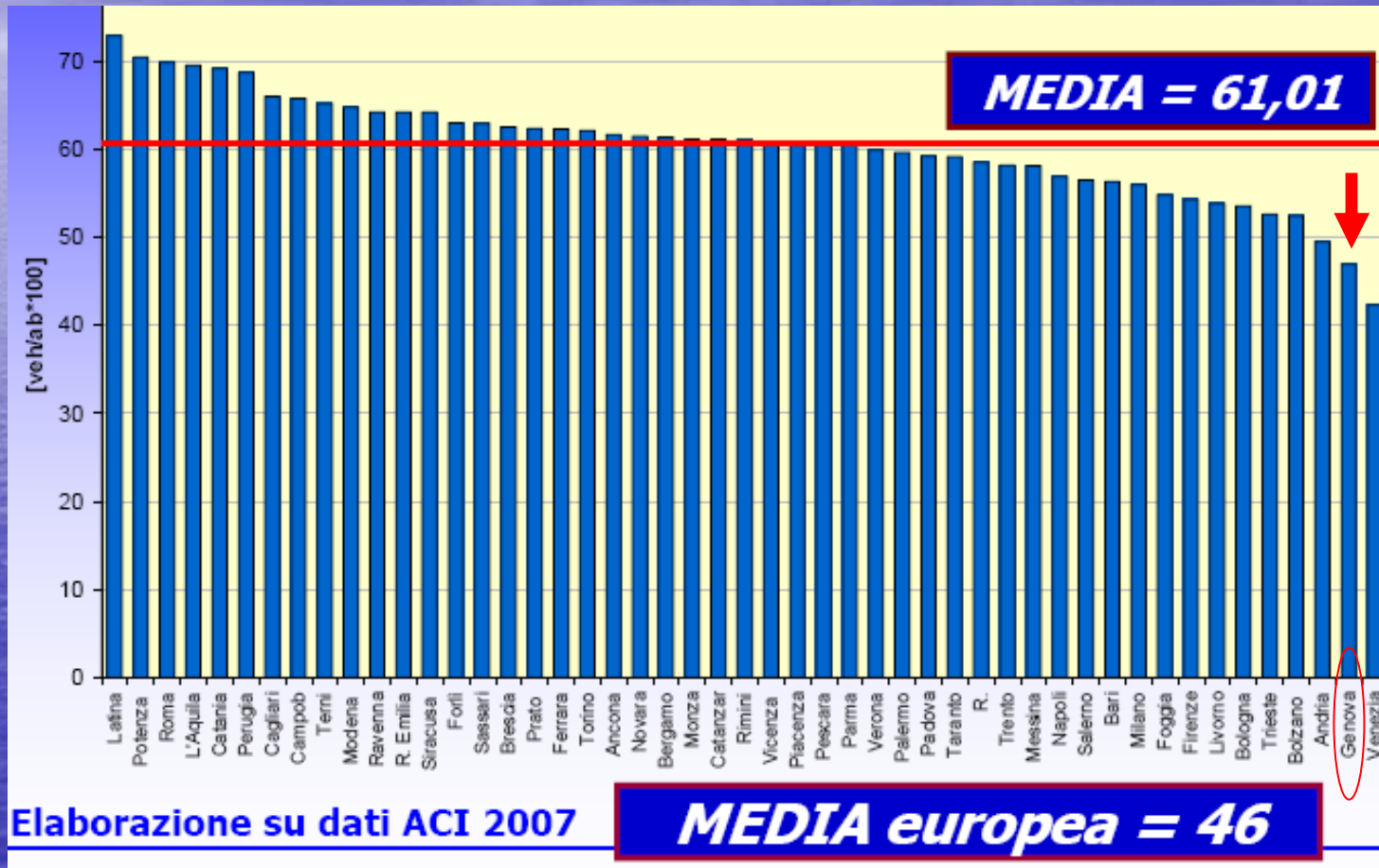
# How is Genova?

My hometown Genova



[http://www.youtube.com/watch?v=PfexKBJY2rk&playnext\\_from=TL&videos=4woeSPAJTb4](http://www.youtube.com/watch?v=PfexKBJY2rk&playnext_from=TL&videos=4woeSPAJTb4)

# Genova the 2° province with lower car ownership in Italy (46 cars/100ab)



... and among the highest motorbike ownership provinces!

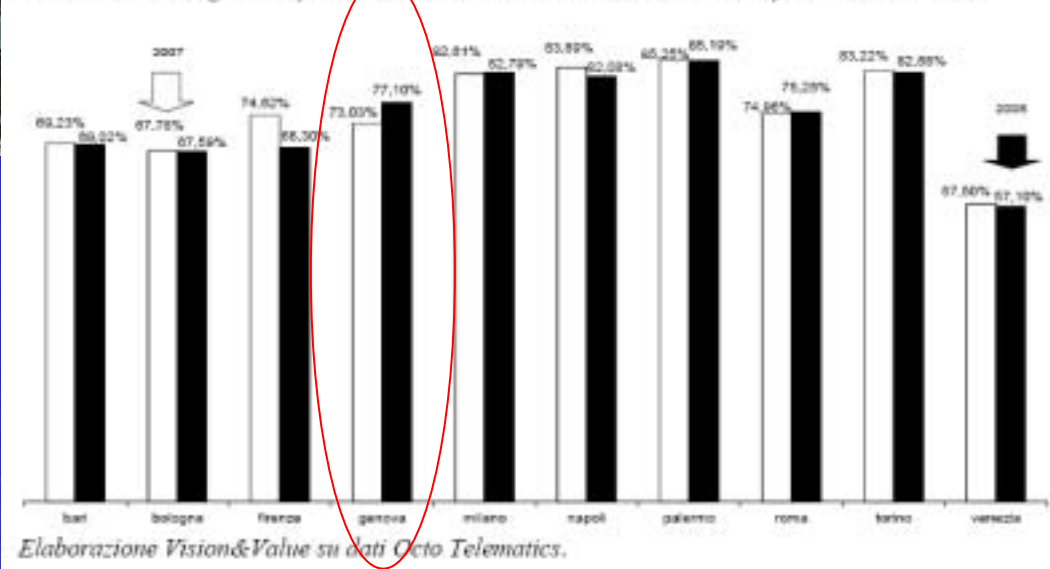


# Nevertheless we greatly suffer of traffic conjection



- Among the highest traffic congested cities in Italy  
... and getting worse

Percentuali in congestione fascia oraria mattina da lunedì a venerdì, confronto 2007 e 2008



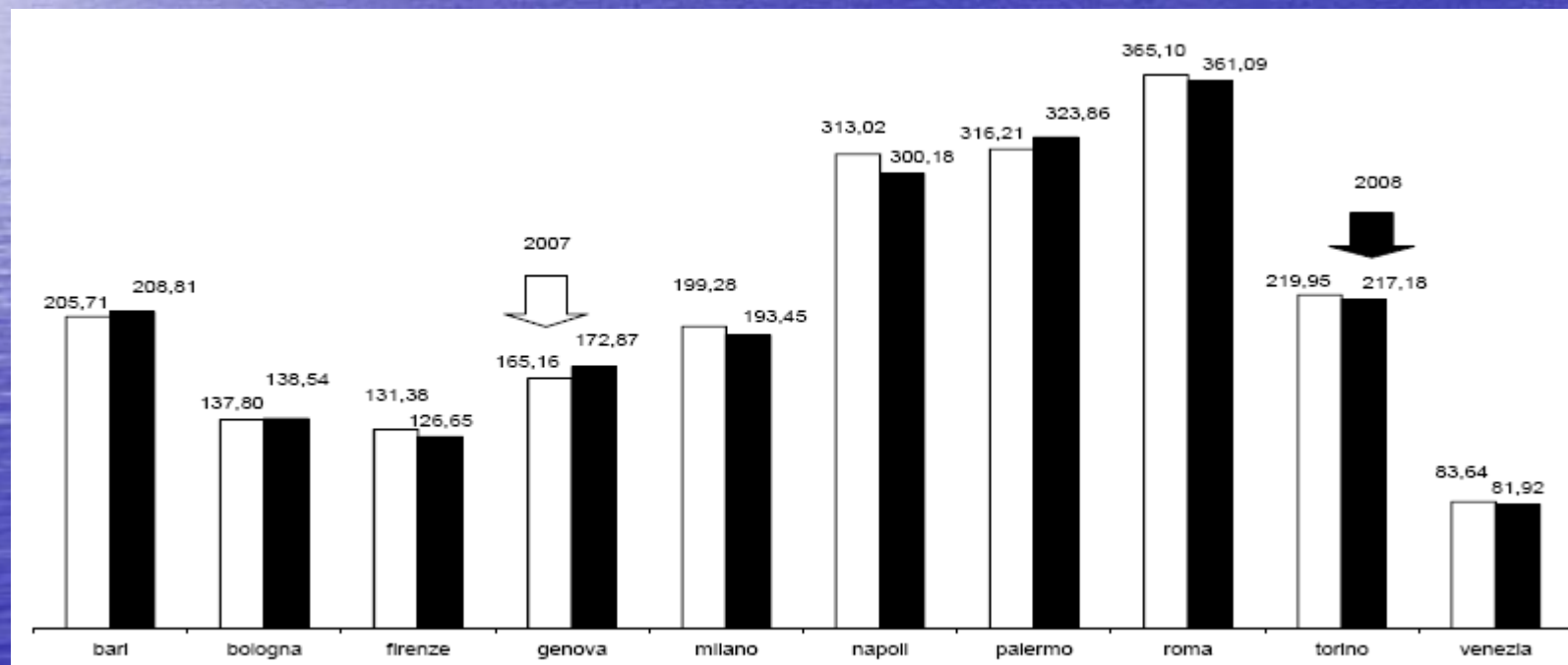


## ... and car space occupation

- 610.897 habitants
- 280.000 cars (46 cars every 100 people, including children and elderly)
- 190.000 parking places
- 90.000 cars in excess!

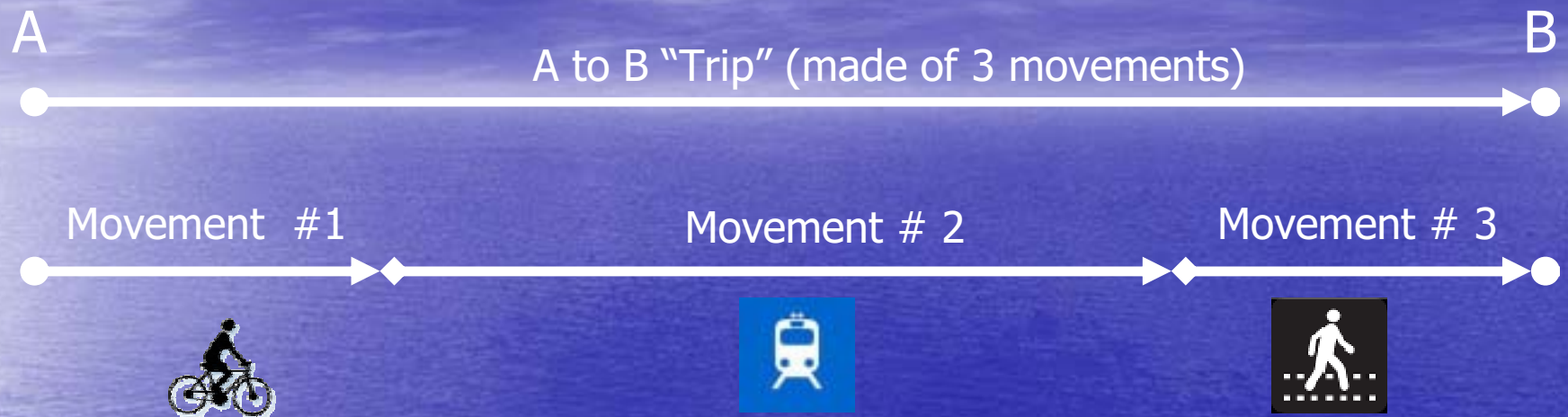
# In Genova cars are used less than 30 min a day

Number of hours the average car is in motion in different cities in Italy, comparison between 2007 and 2008



Elaboration of Vision&Value from Octo Telematics data

# Genoese do not know intermodality



- within Genova province in the peak hours (&) have been estimated:
  - 804.000 movements and
  - 799.000 trips
- This means that more than 99.7% of trips are monomodal!

# Cycling in Genova?

*Typical reaction*



My hometown Genova

[http://www.youtube.com/watch?v=\\_OkofqBGOBU&playnext\\_from=TL&videos=vB0mbhURw6E](http://www.youtube.com/watch?v=_OkofqBGOBU&playnext_from=TL&videos=vB0mbhURw6E)

# Cycling in Genova?

My hometown Genova



- Common opinion:
  - Genova is too hilly
  - There is no space to accomodate cycling paths
  - Genova has never had a cycling tradition
- Result:
  - No municipality cycling policy established yet
  - Less than 1km of cycling paths
  - a recent (unsuccessfull) bike sharing program with electrical bikes

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# ... but one moment

Genova ... a sky resort?



— funiculars



● elevators





# The idea ...

Genova ... a sky resort?



Bike

# The ~~Sky~~-Lift concept

Use vertical public transport (elevators, funiculars, buses) to go uphill, and descend to final destination with your bike !

Genova ... a sky resort?



Ski-Lift

⋮



Ski

=



Vertical Transit

⋮



Bike

# Genova sky resort

Genova ... a sky resort?

**IMPANTI DI RISALITA**

- A** telecabina Morgnosed - Chantorné (mt. 1515 - mt. 1868)
- B** seggiovia quadriposto Chantorné (mt. 1820 - mt. 1954)
- C** seggiovia biposto col Fante (mt. 1750 - mt. 2087)
- D** seggiovia quadriposto Collet (mt. 1850 - mt. 2246)

**NOVITÀ STAGIONE 2009/10**

- Nuova seggiovia quadriposto Collet
- Pista La Vieille
- Nuovi percorsi piste 4 e 3

**PARCO GIOCHI**

- F** tapis roulant
- WINTER PARK**

**SNOWPARK**

- G** White Virus

**PISTE DA FONDO**

- 10** La Maisonnette
- 11** Grandes Mornagnes

**RACCHETTE DA NEVE**

- 12** Chantorné Gorzà
- 13** Chantorné radura Châtelard
- 14** Chantorné Tronchany

**PISTE DA DISCESA con innevamento artificiale**

- 1** Merivo Chantorné-Morgnosed
- 2** Chantorné
- 3** Trosc
- 4** Collet
- 5** Laret
- 6** Fontin
- 7** F. Grange
- 8** La Vieille
- 9** Pista Cress
- 4b** bis -Valanze
- 6a** bis -Valanze

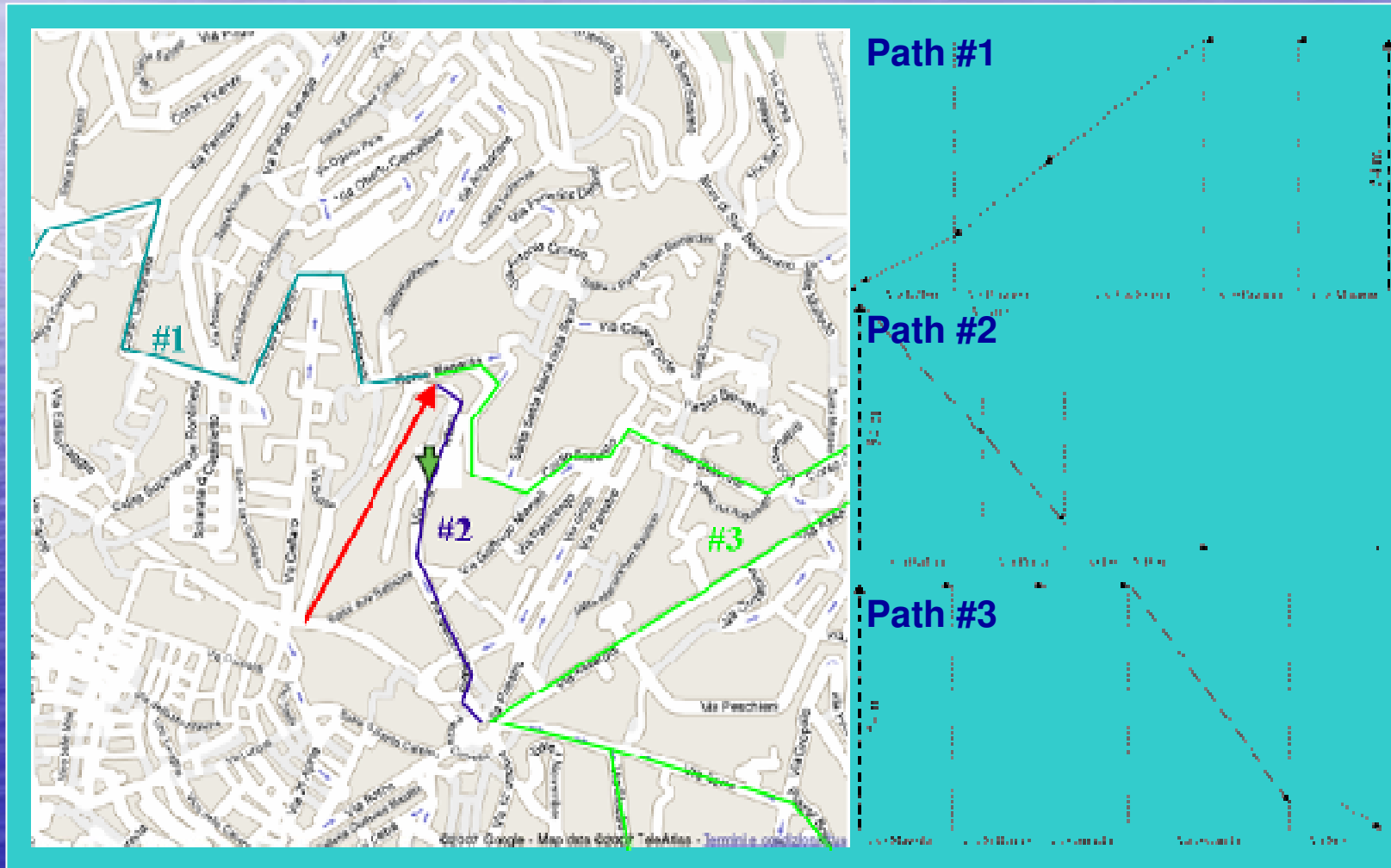
**SERVIZI TURISTICI**

- P** Parcheggio
- X** Puntino di ristoro
- S** Seglietteria
- H** Pattinaggio su ghiaccio
- I** Ufficio informazioni

S.I.R.S. Azienda di risalita  
 Loc. Malvez, 2 - TORGNO  
 tel. 0244.58122 - fax 0244.58123  
 www.torgno.it - info@torgno.it

Genova ... a sky resort?

With a single vertical transportation line, you can cover a vast area



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# Why folding bikes?



considered as hand luggage

- No extra ticket**
- No special wagons**
- No hour restrictions**



Low space occupation  
**Many bikes can be accommodated in existing infrastructure**

**15 sec to fold / unfold**



Can be carried on elevators  
Can be stored "under the desk"

→ **Anti-theft**



Rideable as a normal bike  
3 ÷ 8 gears

→ **More Agile for urban spaces**

Why folding bike help

# With folding bikes not only funiculars and elevators

Why folding bike help



- The following may serve the purpose:
  - Bus lines that go uphill
  - Taxi service with moderated prices (municipality financial help)
  - School buses
  - ... or even hitch hiking



The image features a serene background of a clear blue sky with wispy clouds above a calm, deep blue ocean. The horizon line is visible in the middle ground. Centered over this scene is the text "Little Green Bike video" in a white, sans-serif font with a subtle drop shadow.

Little Green Bike video



# Alternatives to folding bikes (1)

Why folding bike help



- Bike racks could be used for exploiting buses as vertical means of transportation with standard bikes
- but:
  - at the moment not allowed in europe
  - only 2 (max 3) bikes per bus

## Alternatives to folding bikes (2)



- Special Tram/Funicular wagons
- E.g. Tram in Stuttgart (Germany)

# Alternatives to folding bikes (3)

Why folding bike help



- Purposely designed transportation systems such the Trampe system in Trondheim (Norway)
- but:
  - Short distances
  - Dedicated to bikes
  - Not much elevation
  - Not very practical

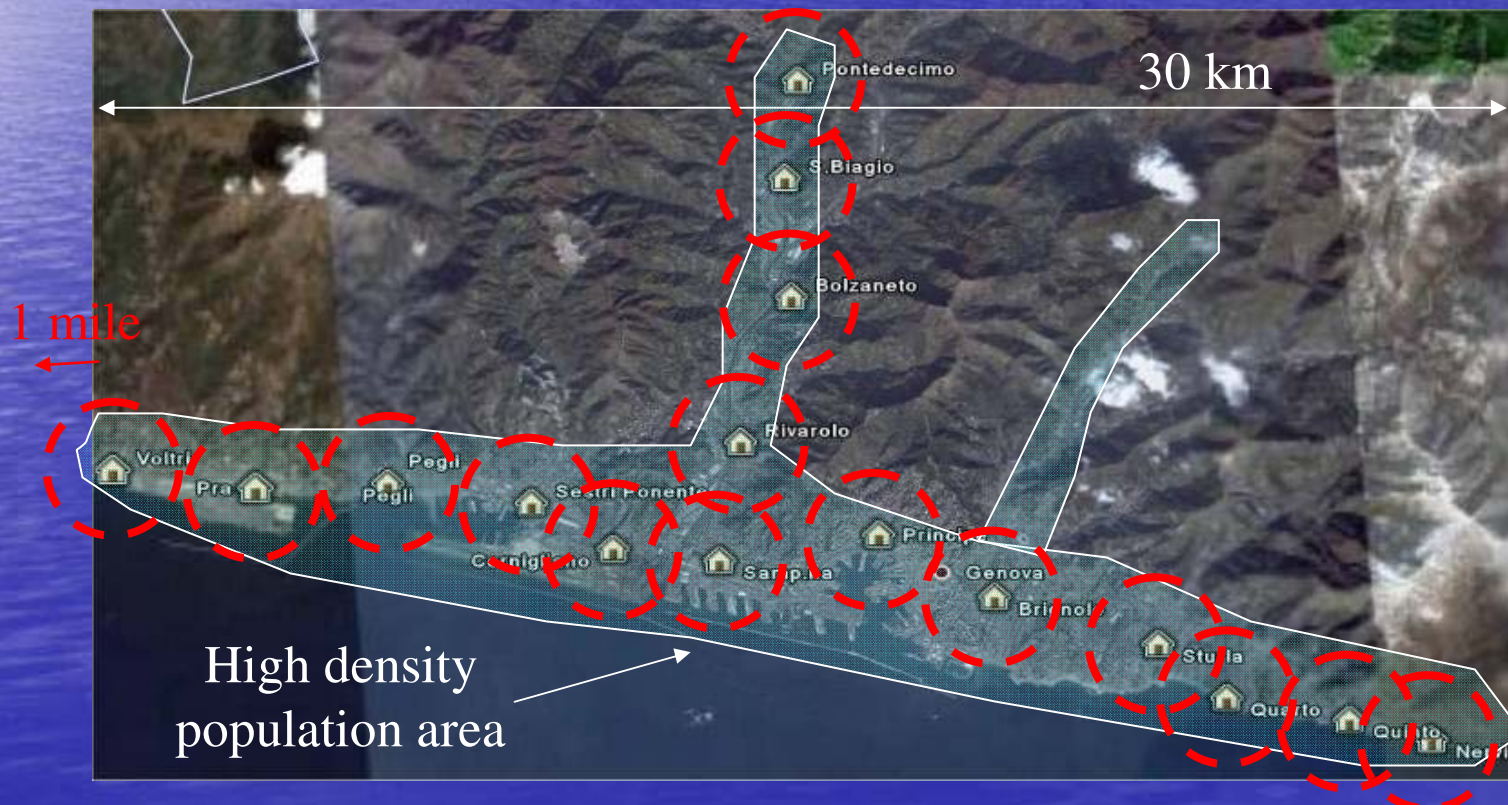


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# Genova's metro train last mile solution

- 30 km railway along the sea, with 12 railway stations
  - approx. one station every 2 miles
- ➔ most of the trips could be done bike+train, with bike segments <1 mile



The definitive "last mile" solution

# Genova's metro train last mile solution

The definitive "last mile" solution

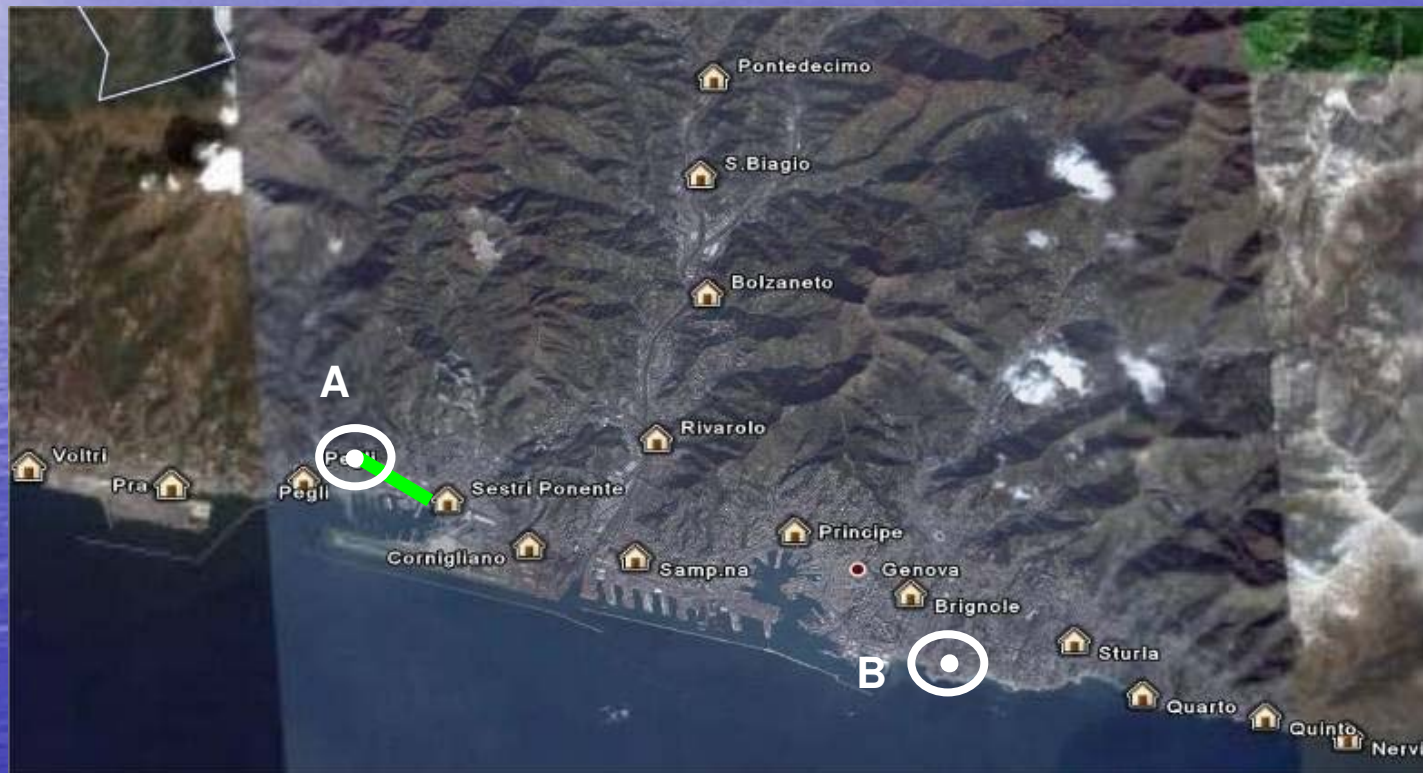


A•

•B

# Genova's metro train last mile solution

The definitive "last mile" solution



•B

# Genova's metro train last mile solution

The definitive "last mile" solution





# Genova's metro train last mile solution

The definitive "last mile" solution



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# Hilly cities

## *Folding vs Electric Bikes*



- Electric engine assistance
  - transforms steep hills in flat rides
  - allow to cover relatively longer distances without sweating
- but consider that ...
  - **Battery charge** dries up quite quickly on hills: 30km range of datasheet is on flat and could become 10km or less on hills
  - forget **inter-modality**: OK only if you can reach from home a destination by bike (~5 km commuting distance)
  - You need a **supervised parking** place at home and at destination to avoid thefts

# Hilly cities

## *Folding & Electric Bikes*



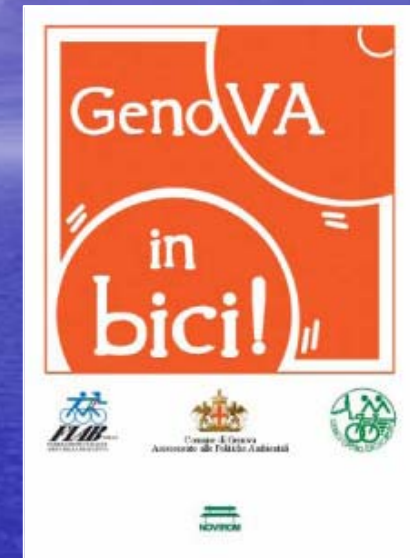
- Min of 6 kg extra weight (could be from 11 to 17 kg)
  - Typically less compact than a standard folder
  - In some models electrical engine adds resistance when switched-off
- > **At the moment not recommended, but with technical advancements may be in future an option to consider**

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# Field trials & results

- 2004 First experiments
- 2006 Involvement of local cycling association & field public trials
- 2007 "GenoVa in Bici" publication sponsored by Genoa Municipality  
results presentation to 1st Italian Conference on cycling mobility
- 2008 experiences in other cities (Naples, Trieste)
- 2009 presentation to VeloCity conference in Bruxelles



Trials and lesson learned



# The "Genova a ruota libera" trial (2007)

- Objective: verify if benefits of **bike+public transport** integration and **electrical bikes** could change perception of Genoese on bikes as an urban transportation system



- For **three days**, three volunteers habitual users of cars and **motorcycles**, have left home their car/motorbike and have lived a typical working day riding a folding/electrical/city bike, while a **tutor** was giving assistance

# The “Genova a ruota libera” trial results

- Before the test
    - All had environmental and quality of life concerns, and thought that cycling in general is a good thing, but ...
    - didn't believe cycling could be an option for Genova and for them
    - Have never tried an e-bike nor a folding, and didn't know about bike+public transport options
  - After the test
    - all three declared themselves surprised about the possibilities of e-bikes and bike-on-board options
    - They declared that having the assistance of a Tutor has been of fundamental importance
    - The trial changed their mind: all declared to be evaluating the use of bike for commuting and free time
  - One year after
    - **Two out of three** have switched to bike for commuting and leisure
- > **Lesson learned: let them know and then let them try**



# The role of infomobility

## Plan intermodal trip

- Get informed on which Local Transit to take advantage of
- Find the "bike-wise" best path

## Minimize waiting time

- Arrive at the Local Transit station at the right time
- Get informed on delays

Trials and lesson learned



# Conclusions

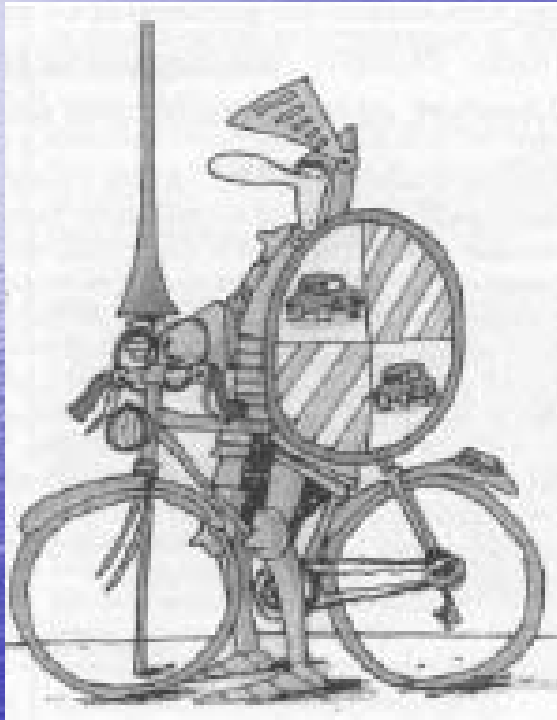
- Few funiculars/elevators could transform your hilly city in a bike-able city
- folding bikes allow to accommodate many people with no/minimal impact on existing infrastructure
- they also enable use of buses, taxi, school buses, etc. as an alternative to funiculars/elevators
- Consider also the integration with trains, metro, etc. to extend the typical bike range
- Advancement in folding bikes and infomobility makes the system quite easy and time-efficient



the end

Picture from "GenoVa In Bici" publication

# Contacts



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