



Consiglio Nazionale
Geometri e Geometri Laureati



*Presented at the FIG Working Week 2016,
May 2-6, 2016 in Christchurch, New Zealand*

THE FUTURE OF TELEMATIC SERVICES FOR ITALIAN SURVEYORS

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FIG Working Week 2016

CHRISTCHURCH, NEW ZEALAND 2-6 MAY 2016

Recovery

from disaster

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GRDNet (GNSS R&D Network), is an advanced GNSS Augmentation Network RTK Infrastructure able to provide RTK correction services based on MRS (Multi-Reference Station)/VRS (Virtual Reference Station) techniques and to integrate any kind of Reference Receiver

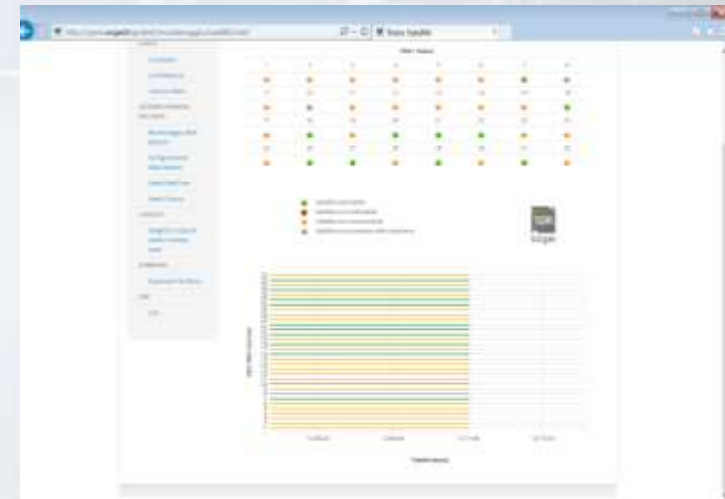
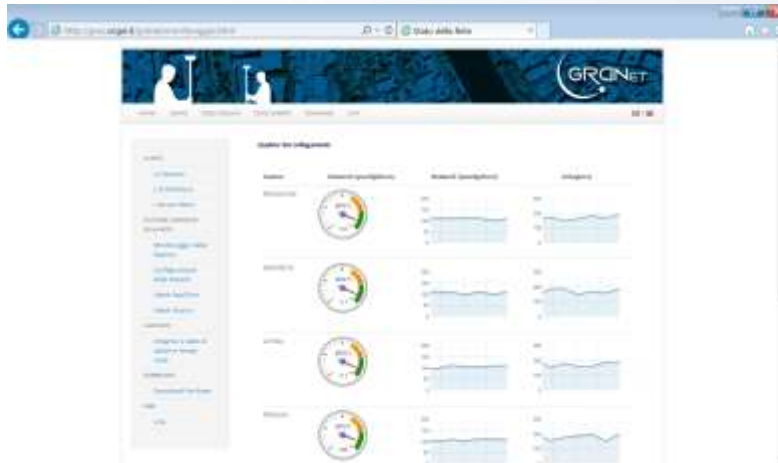
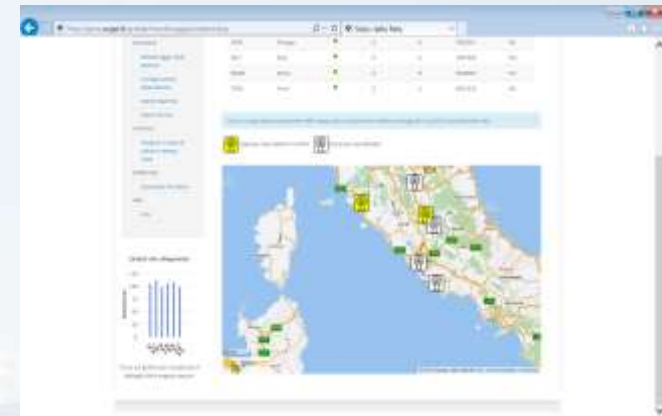




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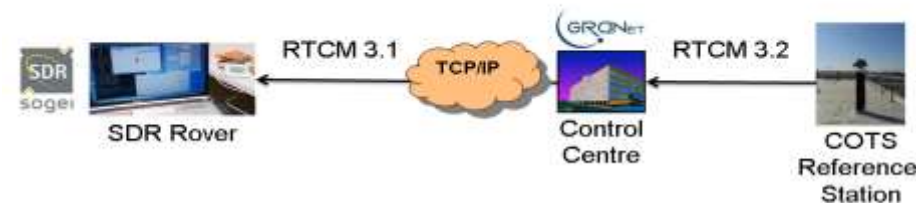
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A Software Defined Radio single frequency real-time GNSS receiver, whose hardware component is reduced to the simple sampler, while all the signal processing is performed via software on a program running on a PC or a Tablet

RTK-SDR – Real Physical Station Processing

- Sampling frequency: 4.092 MHz @ Baseband
- Geodetic Reference Station data from a Local Augmentation Network
- GNSS SDR Rover with COTS surveying antenna
- Communication Interfaces toward the LAAS Service Centre:
 - › Mobile Communication or internal LAN
 - › NTRIP protocol
 - › RTCM 3.1 1004 and 1005 messages
- Carrier-smoothed PR with SBAS corrections applied



GNSS High Precision Surveying Evolution

Local Augmentation Infrastructures

Global Augmentation Infrastructures

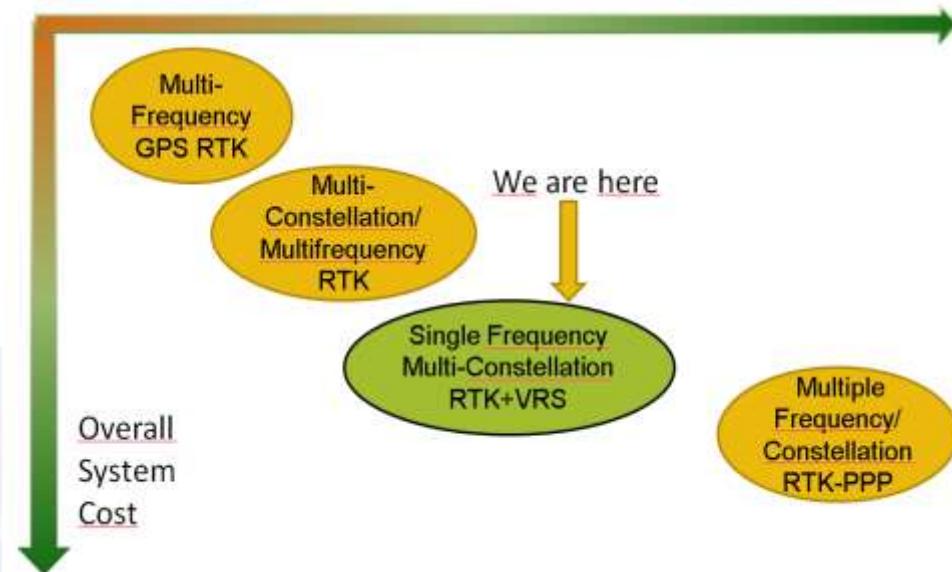




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The Architecture for the Test

- SDR Reference Station: SDR on a PC feeding the GRDNet Control Center for NTRIP corrections delivery in RTCM format
- Rover Receiver: SDR on a Tablet



Total SDR High Precision Results

```

time of receiver clock rover: 2015/12/18 11:32:34.99999978
time sys offset (glo-gps)(s): 0.00000000
solution interval (s) : 1.000
age of differential (s) : 3.000
ratio for ar validation : 191.363
# of satellites rover : 9
# of satellites base : 10
# of valid satellites : 9
GDOP/RODP/HDOP/VDOP : 2.4,2.1,1.1,1.8

-----GNSS SDR SOGEI-----
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RECEIVER OPTIONS:
Clock Steering: ON Actual Sampling Frequency: 4092000.302
Doppler Bias: 116.88Hz Accum Drift Corr: -893.56
Carrier Phase Smoothing: ON Method: Hatch(Fixed Min) Min: 330
Tropo Correction Model: SAAS Avg Corr: 3.38m
Ionos Correction Model: EGNOS[pre:120] Avg Corr: 3.46m

PRN C/MW Elev C/MHz SlowC FastC Tropo Ionos
1 51.3 94.10 330/330 2.8 -0.3 3.0 2.8
3 54.3 69.10 330/330 0.0 -0.5 2.6 2.3
  
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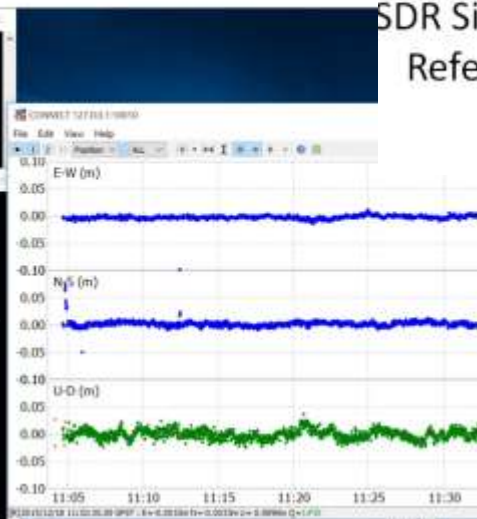


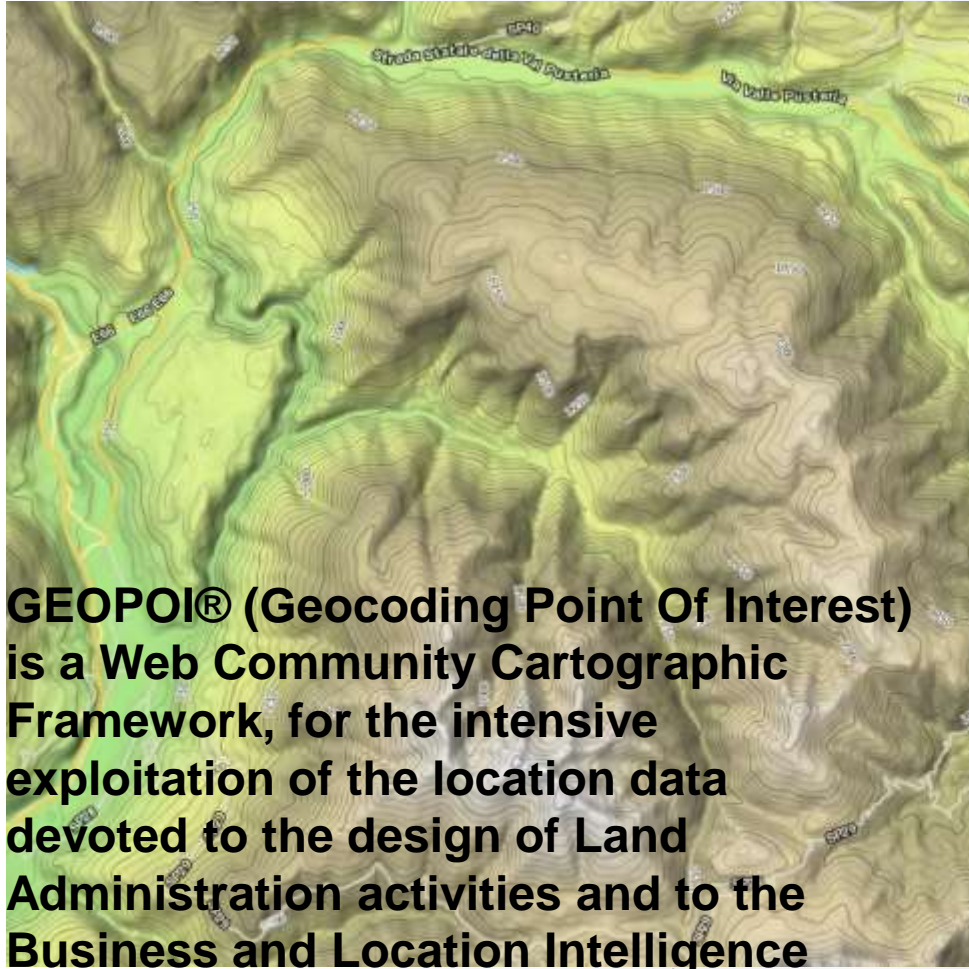


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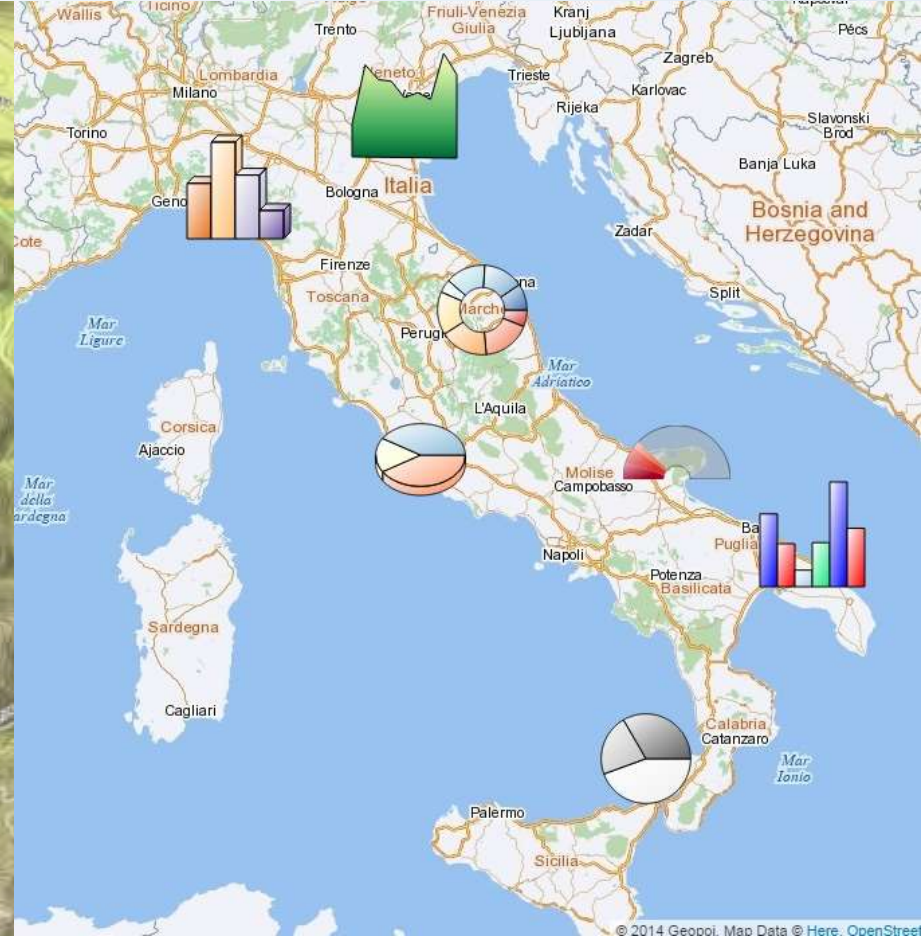
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GEOPOI® (Geocoding Point Of Interest) is a Web Community Cartographic Framework, for the intensive exploitation of the location data devoted to the design of Land Administration activities and to the Business and Location Intelligence



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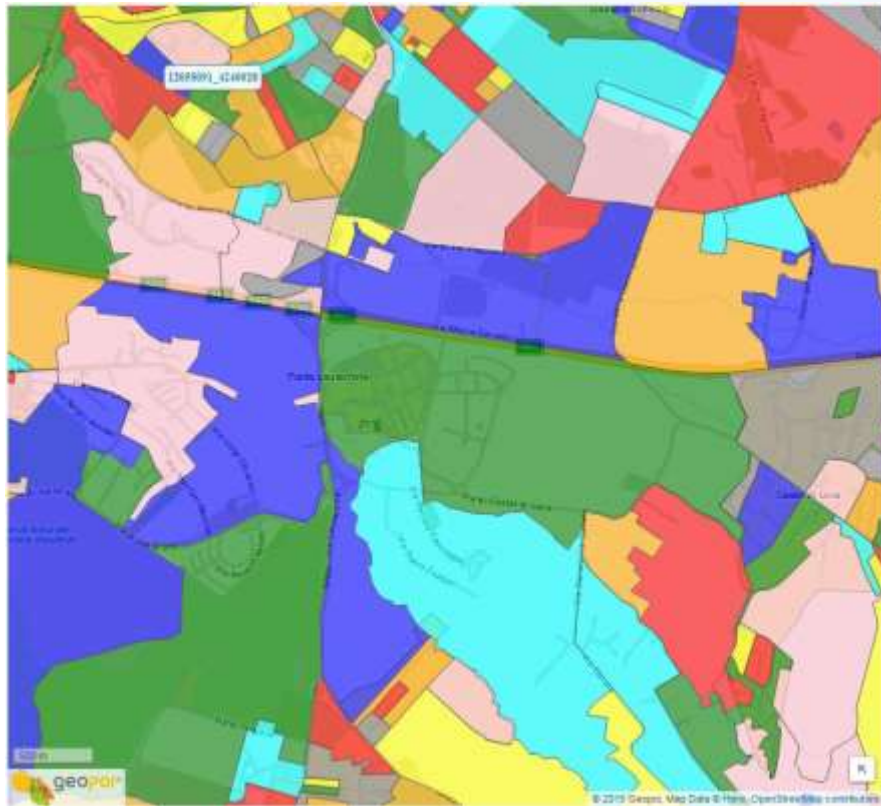


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Carica Cerca Salva Tutti

100 63 (63%) 2 (2%) 35 (35%)

1 2 3 4

Prov	Comune	Indirizzo	Risultato	C
AL	CANTALUPO LIGURE	S.P.SERRAVALLE/CABELLA LOC.TA' PERTUSO SN		
AL	TICINETO	VIA G. MATTEOTTI 106	Via Matteotti 105, Ticineto (AL)	E N
AL	TORTONA	VIA PIEMONTE 11	Via Piemonte 11, Tortona (AL)	E N
AV	MONTELLA	VIA SAN FRANCESCO SNC	Via San Francesco 1, Montella (AV)	E N
AV	ROTONDI	S.S. APPIA KM 239+139 SNC	Via Appia 1, Rotondi (AV)	E N
BG	NEMBRO	VIA ROMA 52	Via Roma 52, Nembro	E N

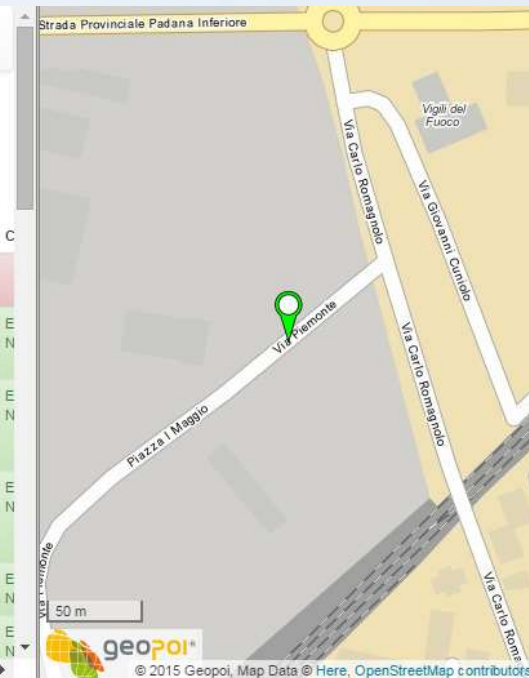




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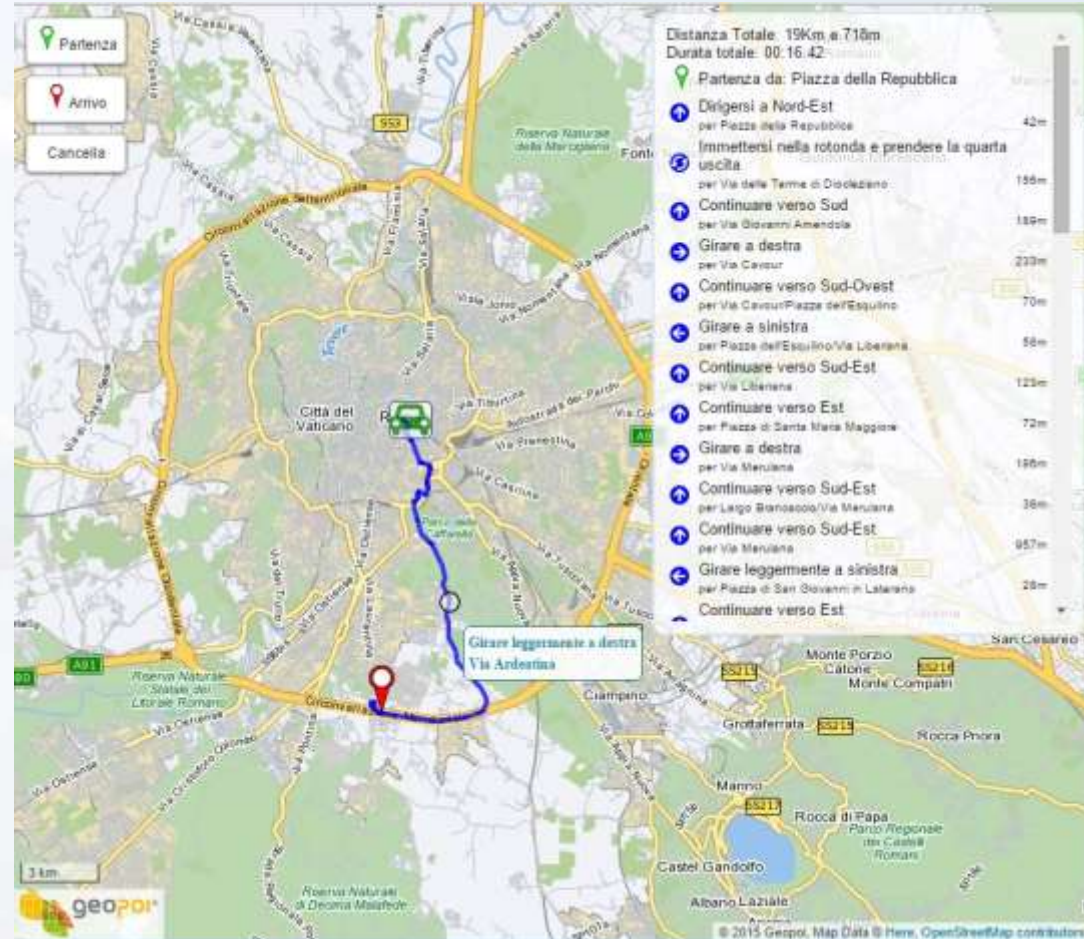
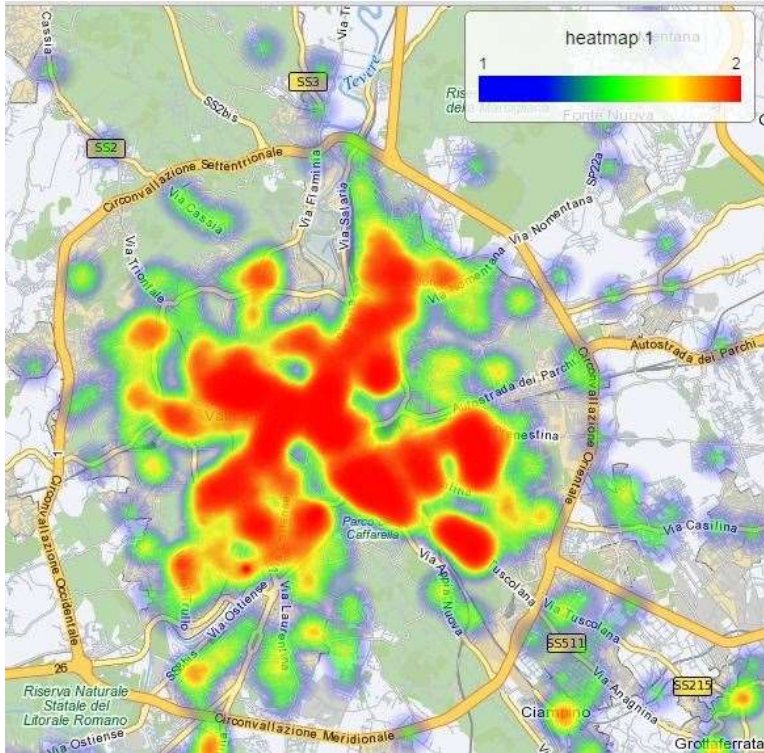




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THANK YOU



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