



Cell phone GeoBigData for the analysis of presences and movements of people

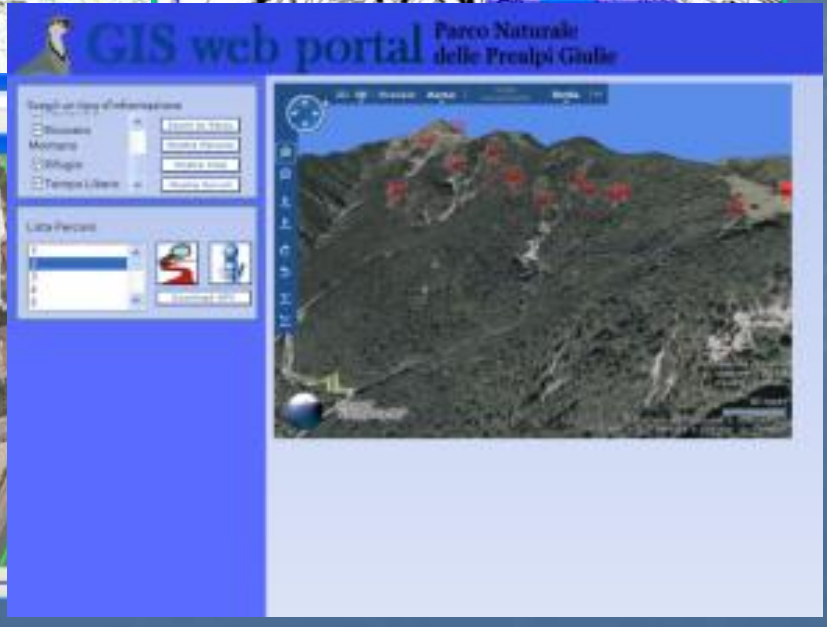
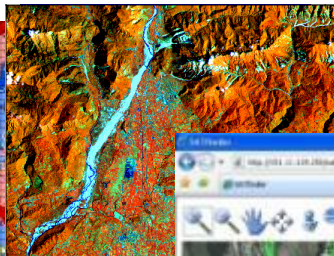
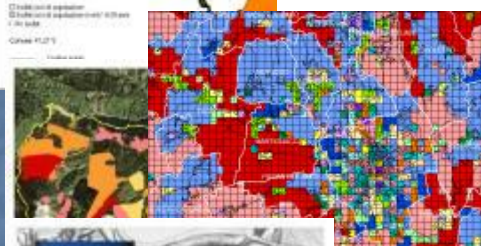
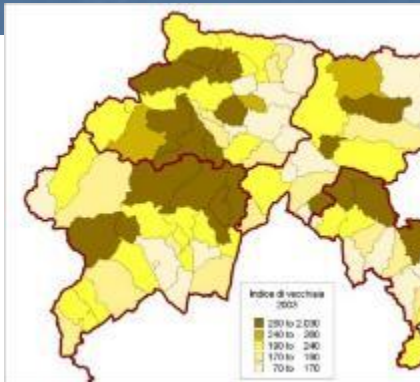
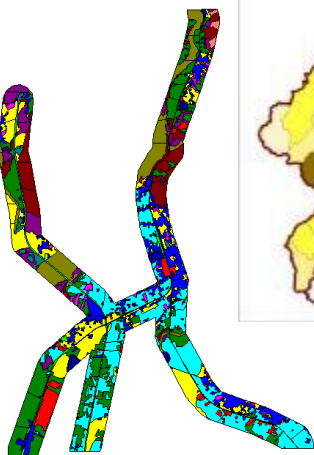
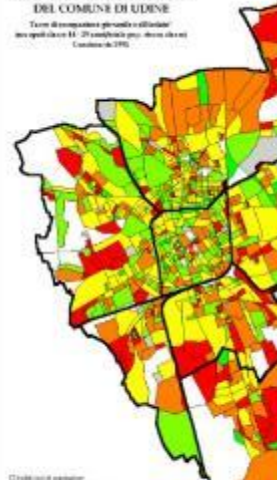


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Geomatic Lab, University of Udine (Italy)



Geomatic Lab of University of Udine

ATLANTE SOCIO-DEMOGRAFICO DEL COMUNE DI UDINE





TELCO Mobile data



BTS
Base Transceiver
Station
Counters

How many
users
connected



CDR CS
Call Data
Records

10 record/day
65Mil/day

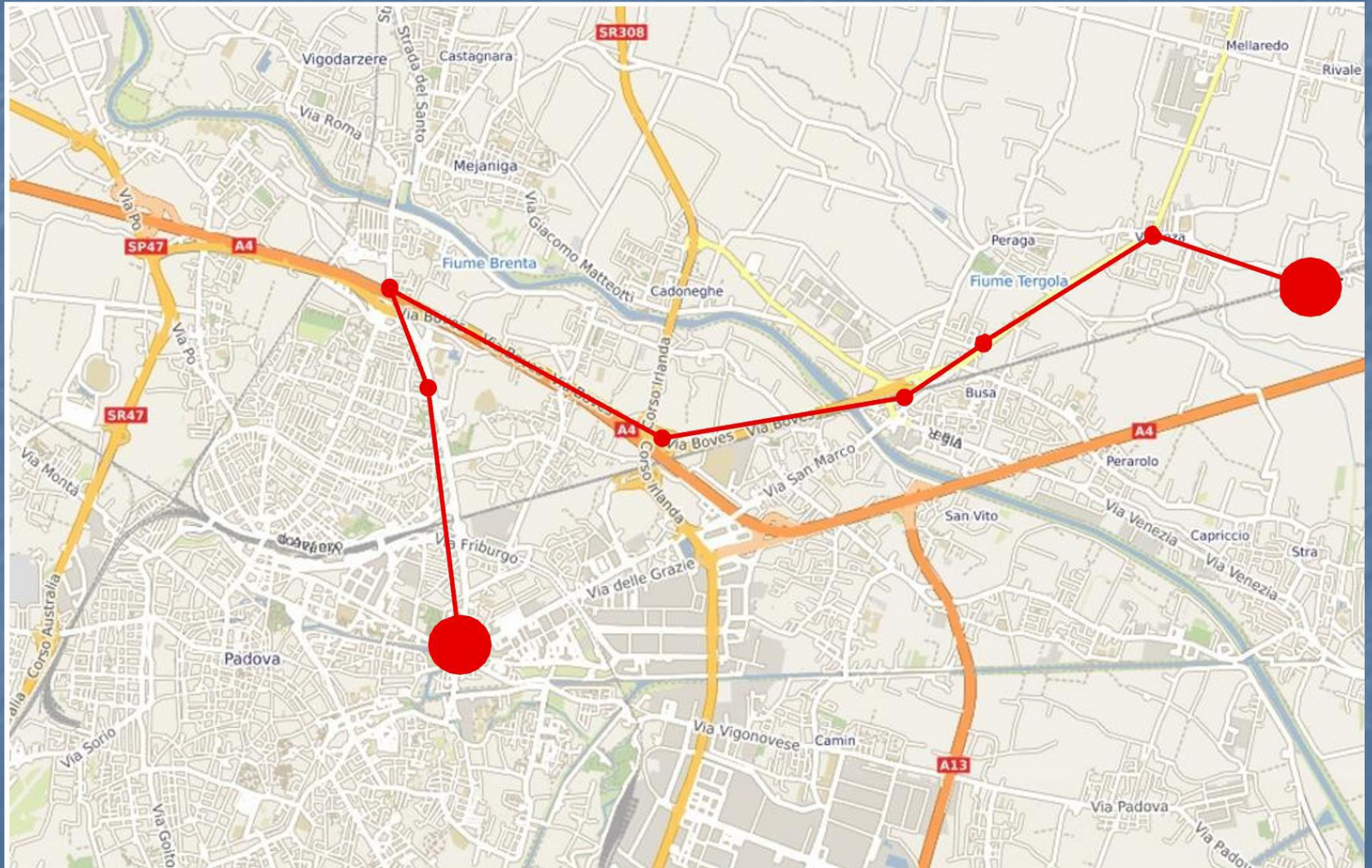


PROBE PS
NetworkData

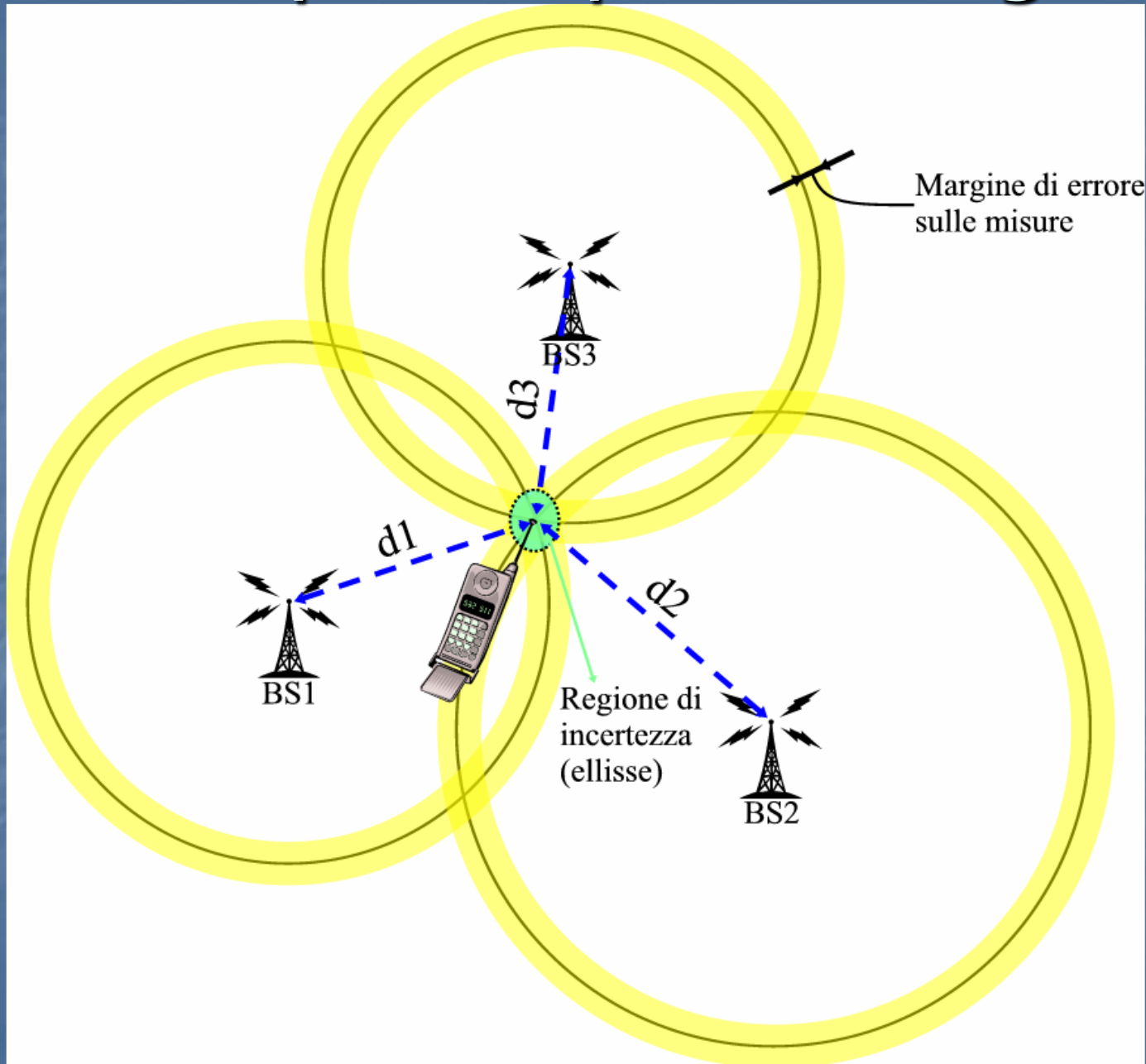
Customer
details
Every minute

1200 record/day
20Bil/day

Mobile data

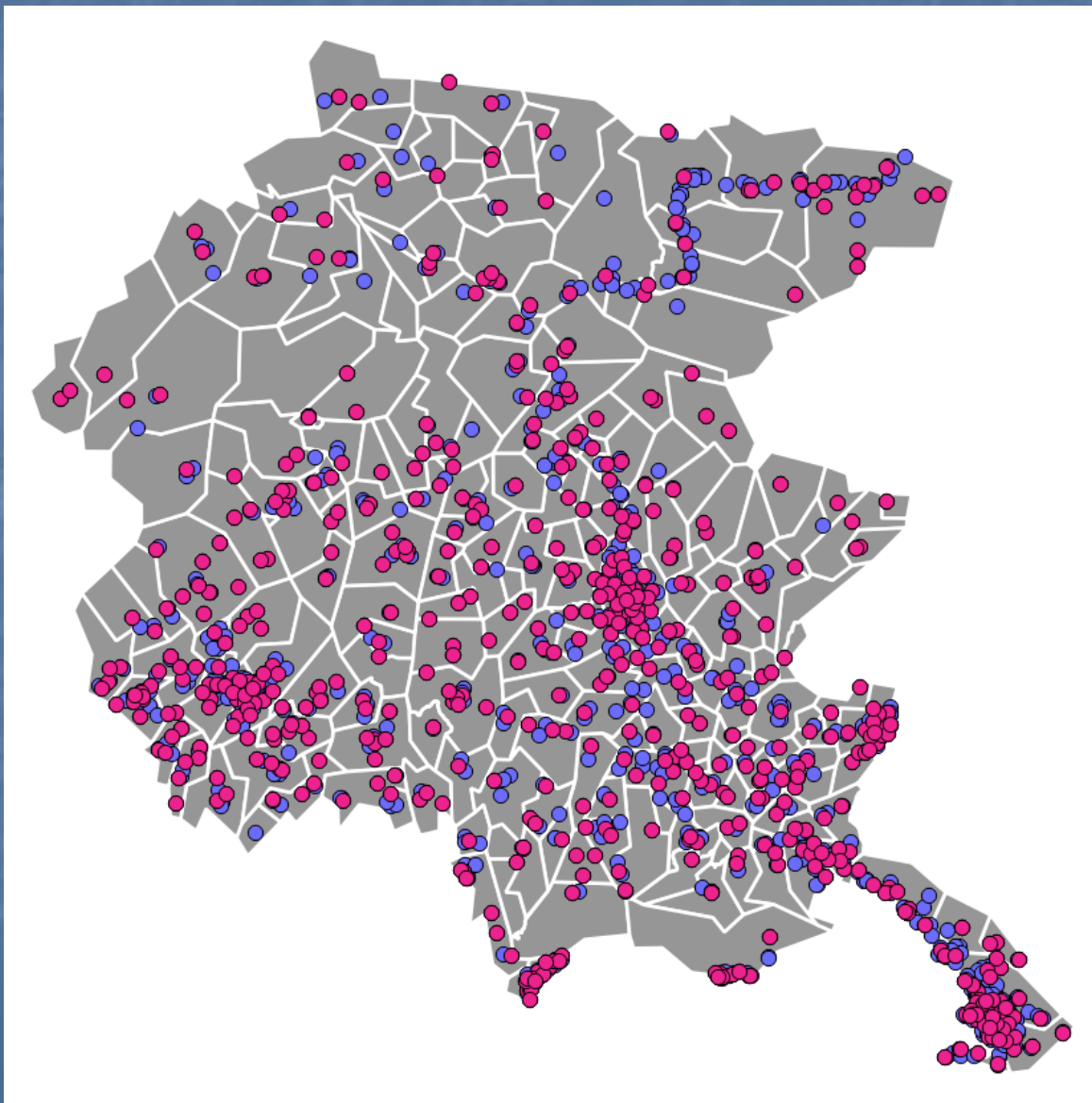


Cell phone positioning

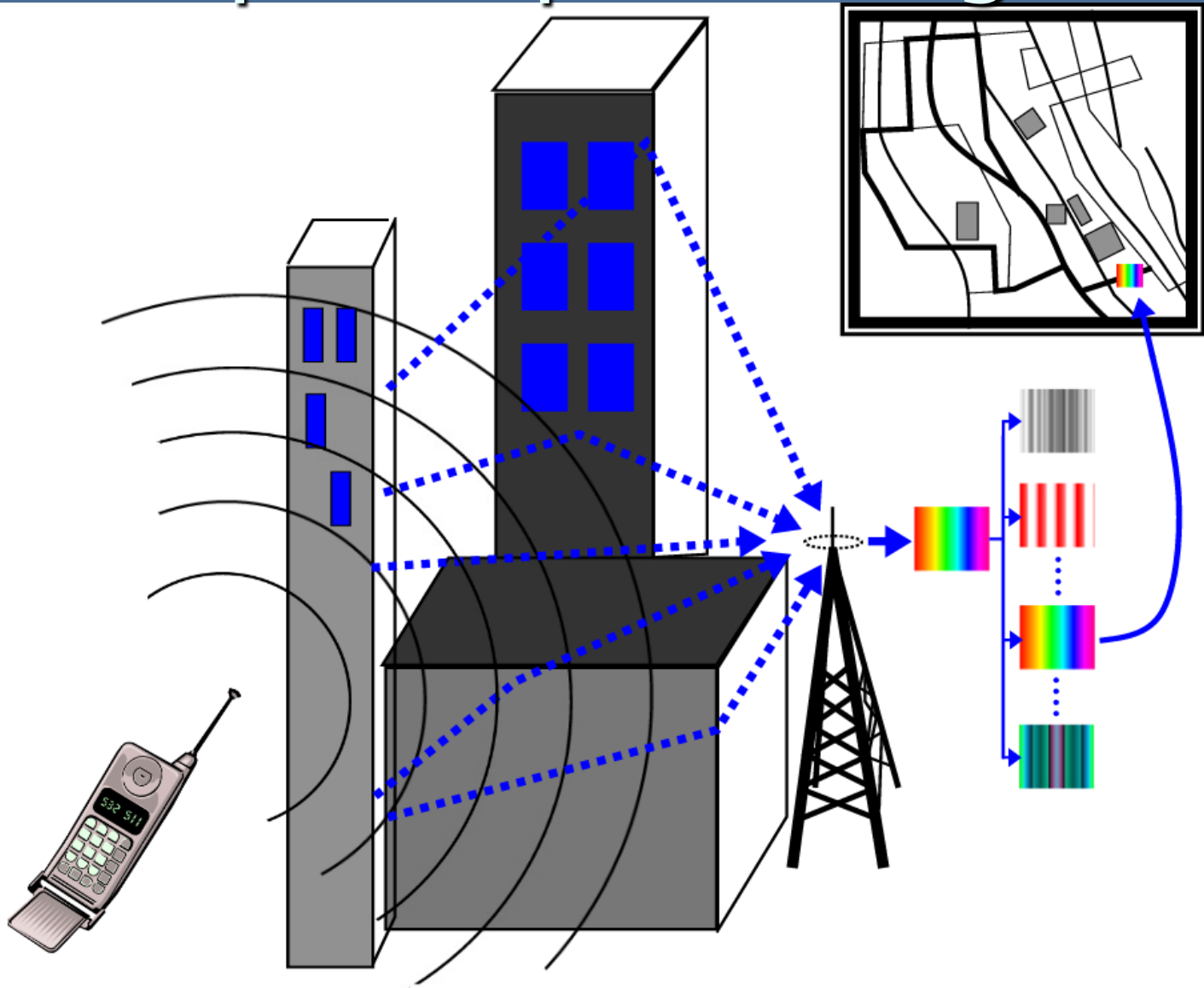




Mobile data coverage



Cell phone positioning





Cell phone data

people inside a cell of 150X150 meters

foreigners with state of origin

Italians by region of origin and typology (residents, regular visitors,
occasional visitors)

every 15 minutes

Friuli Venezia Giulia

<https://goo.gl/maps/QoER4HBTttAiu8vHA>

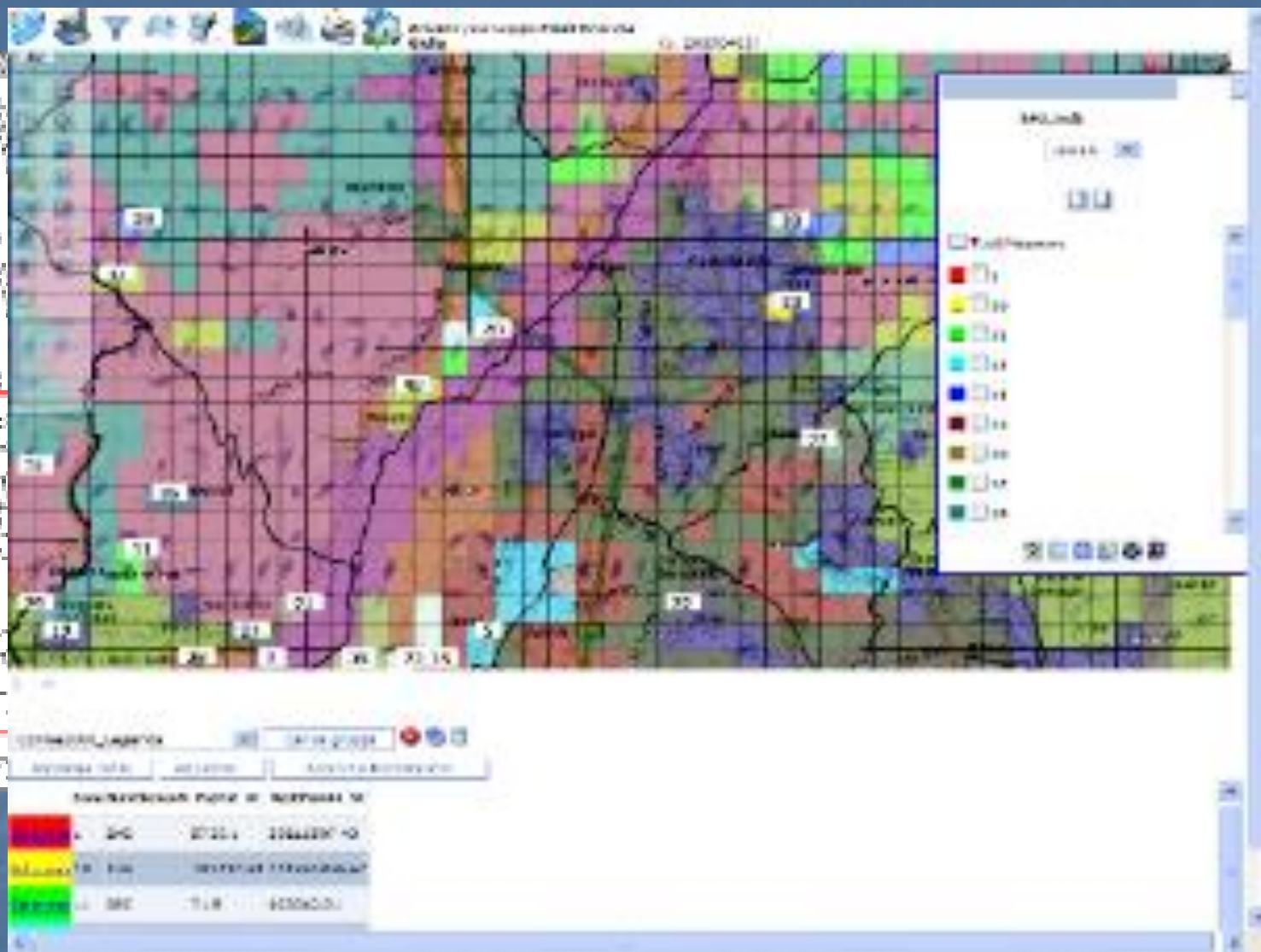
about 350,000 cells

35 million records per day

12 billion records per year



Cell phone data





Presences

 Far East Film Festival 22-30 April

Friuli Venezia Giulia

Reimposta

Condividi



Mappatura degli utenti sul territorio

Matrici origine / destinazione

Monitoraggio zone turistiche e c.c.



REGIONE AUTONOMA
FRIULI VENEZIA GIULIA

Provincia: Udine

(1)

Comune: Udine

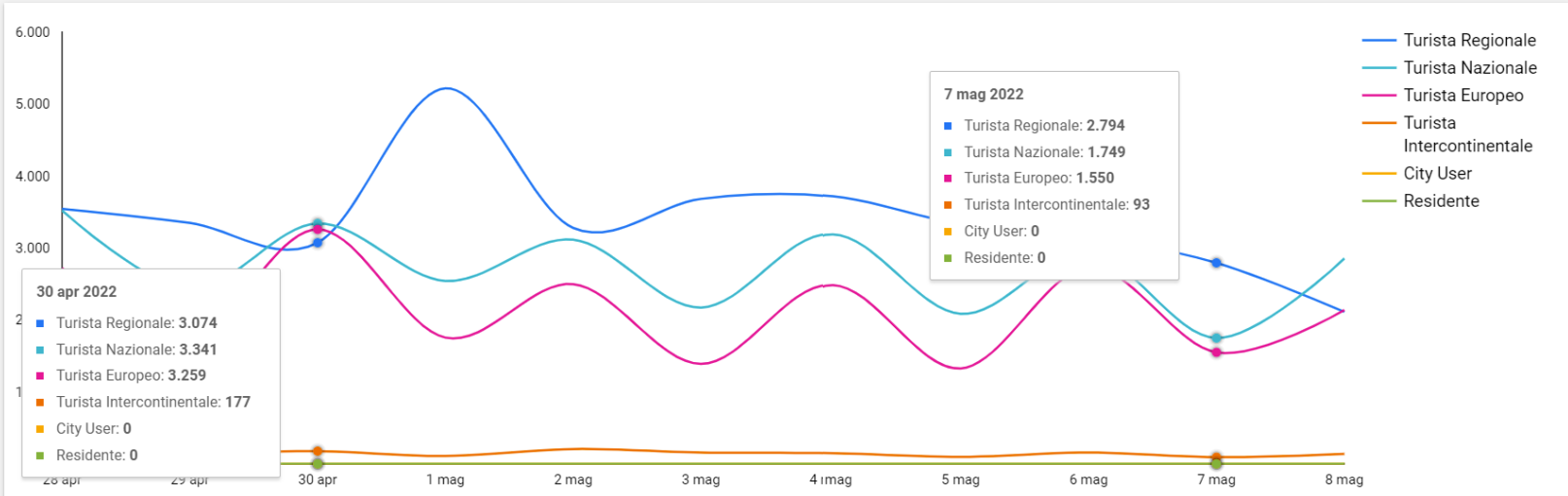
(1)

28 apr 2022 - 8 mag 2022

Visite

Escludi City Users

Escludi Residenti

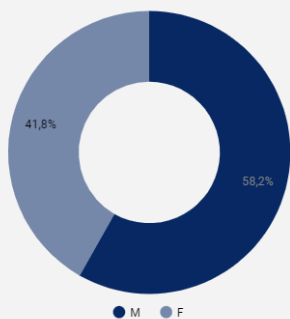




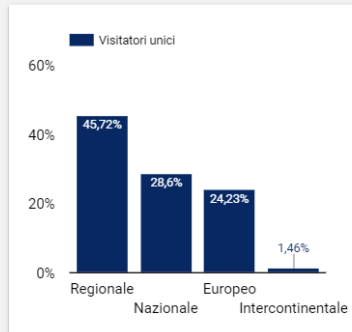
Temporal distribution

Giorno	Italiani	Stranieri	Turista Nazionale	Turista Regionale	Turista Europeo	Turista Intercontinentale	Età 18-24	Età 25-34	Età 35-44	Età 45-54	Età 55-64	Età 65+
8 mag 2022	80,4%	19,6%	39,4%	29,2%	29,5%	1,9%	7,2%	17,4%	17,4%	25,6%	19%	13,3%
7 mag 2022	82,7%	17,3%	28,3%	45,2%	25,1%	1,5%	6,5%	18,4%	16,1%	26,6%	20,6%	11,7%
6 mag 2022	83,1%	16,9%	32,8%	35,1%	30,4%	1,8%	8,3%	17%	16,2%	28,3%	20%	10,2%
5 mag 2022	82,8%	17,2%	30,5%	48,7%	19,4%	1,4%	11,6%	15,5%	15,3%	27,8%	20,4%	9,5%
4 mag 2022	82%	18%	33,4%	39%	26%	1,6%	11%	15,8%	14,2%	28,2%	21,4%	9,3%
3 mag 2022	82,9%	17,1%	29,3%	49,7%	18,8%	2,1%	12,1%	16,1%	14,9%	27,3%	19,9%	9,8%
2 mag 2022	81,5%	18,5%	34,2%	36%	27,4%	2,3%	11,7%	15,9%	15,7%	26,8%	19%	10,8%
1 mag 2022	85,2%	14,8%	26,4%	54,2%	18,2%	1,1%	7,1%	16,9%	18,1%	29,4%	17,3%	11,2%
30 apr 2022	81,7%	18,3%	33,9%	31,2%	33,1%	1,8%	6,5%	18,7%	18,9%	25,4%	19,2%	11,3%
29 apr 2022	84,6%	15,4%	31,6%	43,6%	22,9%	1,9%	10,6%	16,5%	14,4%	28,8%	18,9%	10,8%

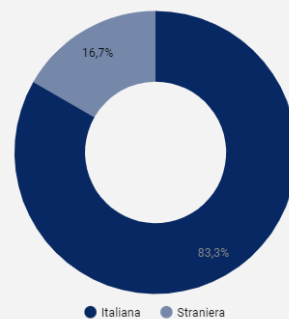
Sesso



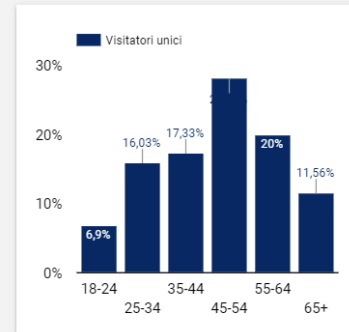
Tipologia visitatore



Nazionalità



Età



Origin Destination

Daily trips Udine - Trieste

Friuli Venezia Giulia

Reimposta

Condividi

Mappatura degli utenti sul territorio

Matrici origine / destinazione

Monitoraggio zone turistiche e c.c.



REGIONE AUTONOMA
FRIULI VENEZIA GIULIA

2 mag 2022 - 6 mag 2022

Provincia di partenza

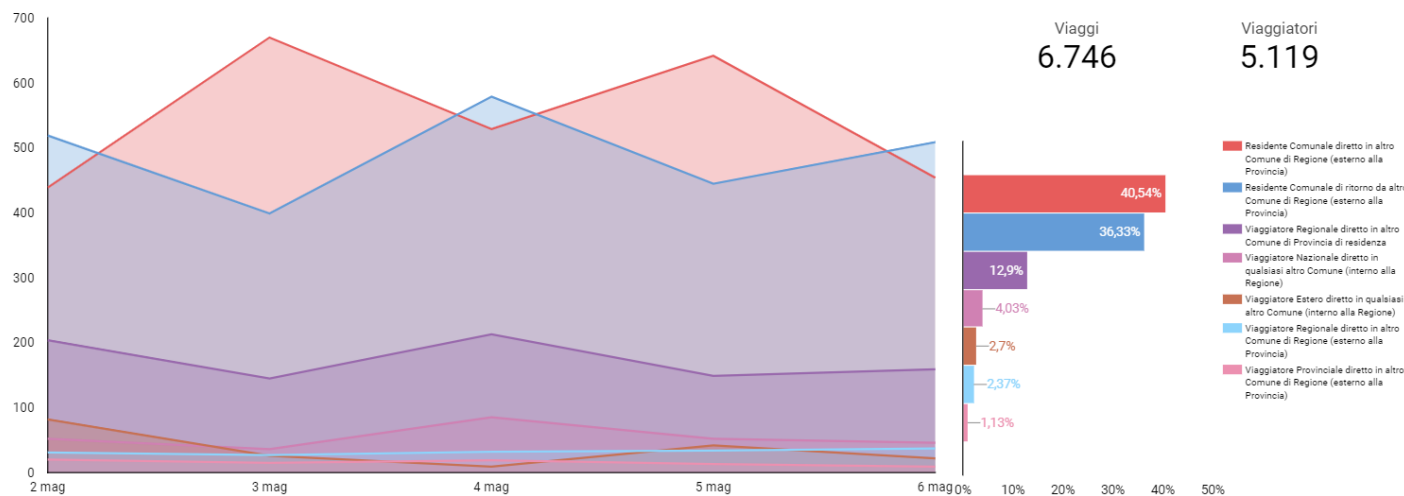
Provincia di arrivo

Comune di partenza... (1)

Comune di arrivo: Ud... (1)

Tipologia viaggiato...

Viaggi giornalieri





Origin Destination *trips distribution*

Friuli Venezia Giulia

Reimposta

Condividi

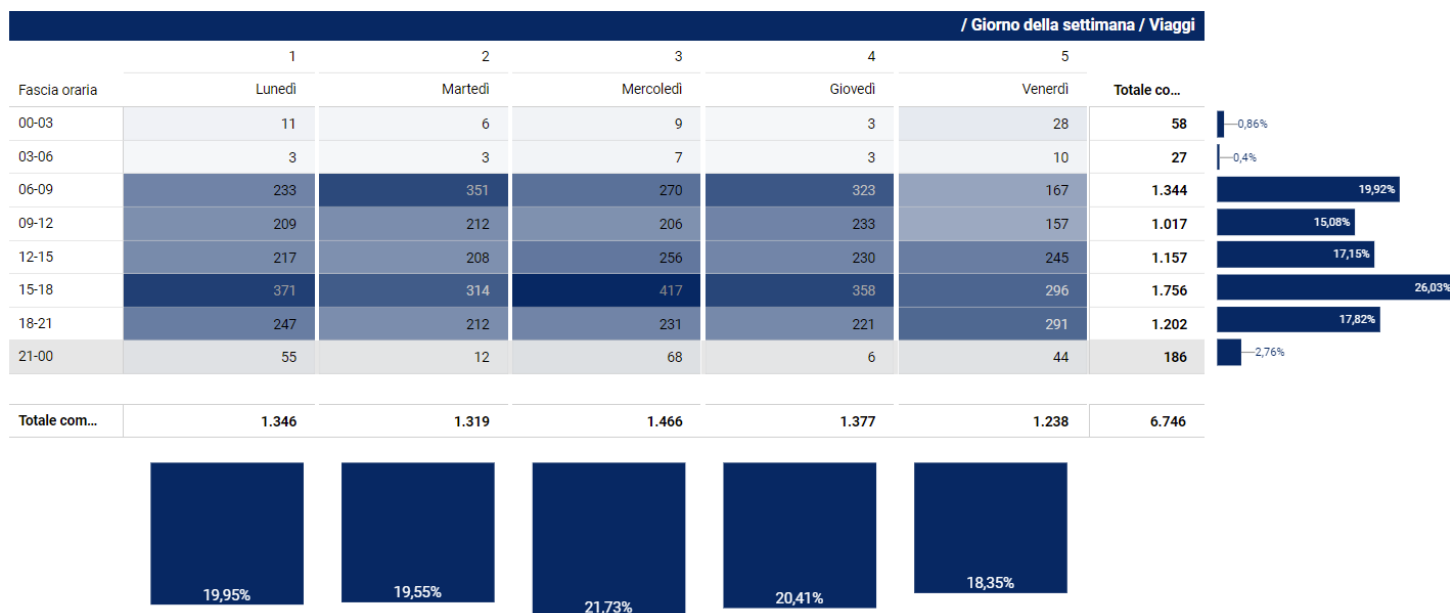
Mappatura degli utenti sul territorio

Matrici origine / destinazione

Monitoraggio zone turistiche e c.c.

2 mag 3 mag 4 mag 5 mag 6 mag 0% 10% 20% 30% 40% 50%

Distribuzione temporale dei viaggi





Origin Destination trip duration

Friuli Venezia Giulia

Reimposta

Condividi

Mappatura degli utenti sul territorio

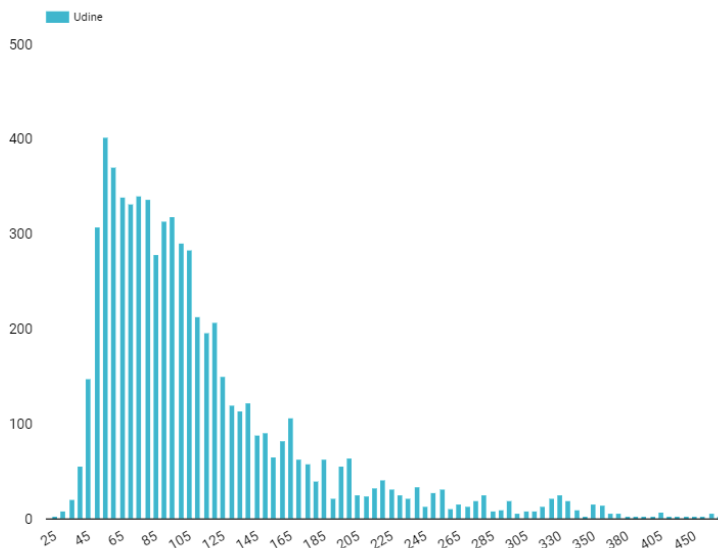
Matrici origine / destinazione

Monitoraggio zone turistiche e c.c.

21,73%

20,91%

Durata viaggi



Comune di partenza

Comune di arrivo

Comune di origine

Comune di arrivo

Durata viaggio

Trieste

Udine

00:57:00



Main destinations *Città Fiera mall*



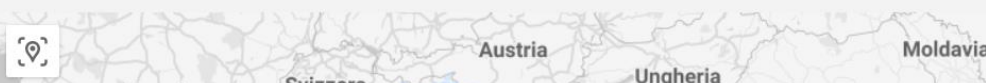
REGIONE AUTONOMA
FRIULI VENEZIA GIULIA

1 apr 2022 - 30 apr 2022

Tipologia di visitatori

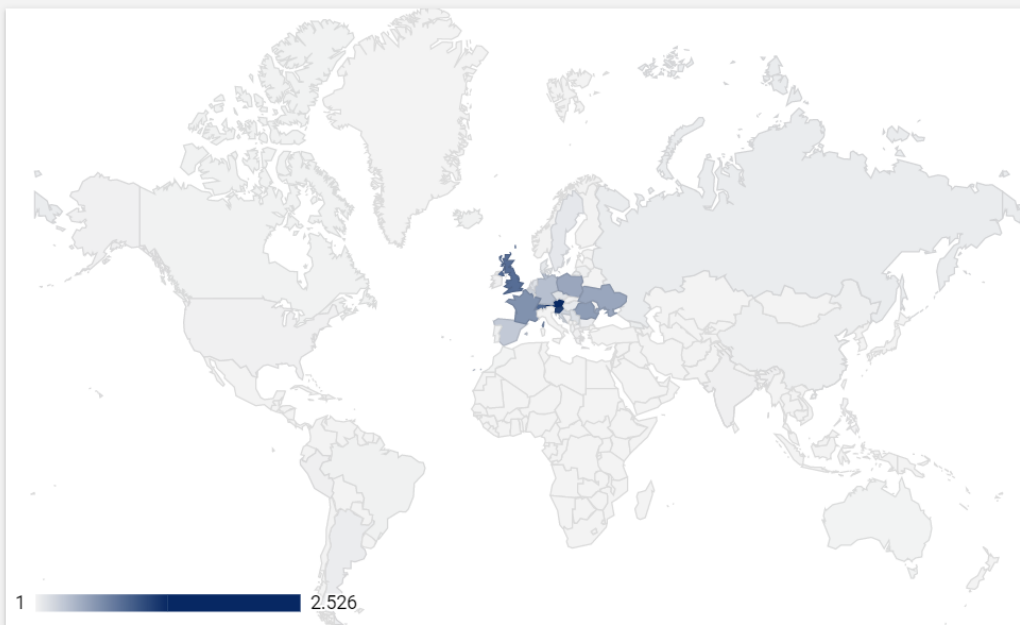
Punto di interesse: Città Fiera (1)

Provenienza visitatori nazionali



Punto di interesse	Provincia	Comune	Visite...	Visitatori
Città Fiera	Udine	Udine	63.309	63.309

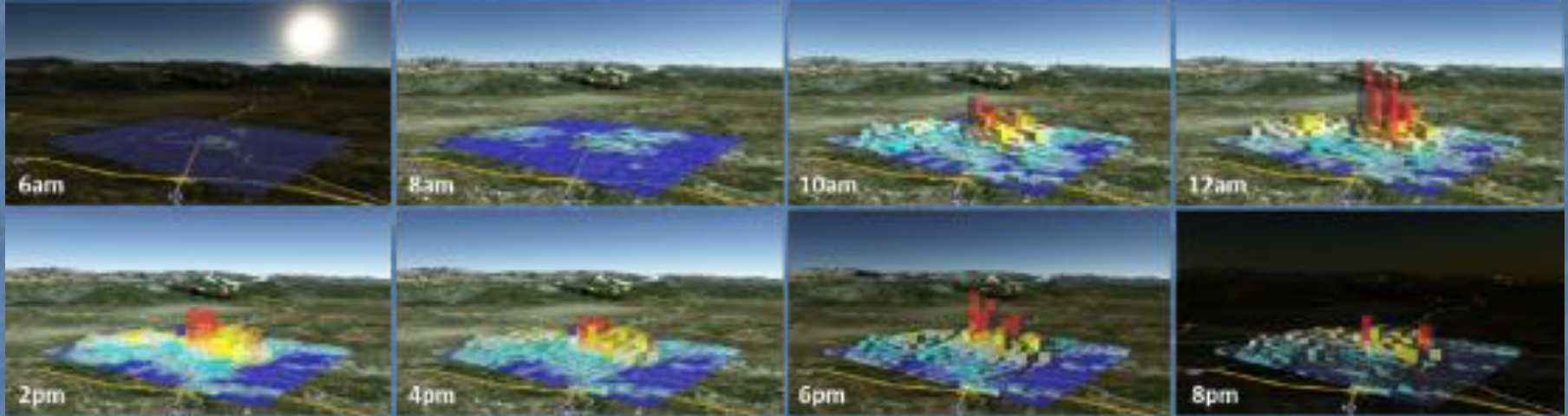
Provenienza viaggiatori internazionali



Punto di ...	Paese	Visite	Visitatori
Città Fiera	Austria	2.526	2.526
Città Fiera	Slovenia	1.116	1.116
Città Fiera	Svizzera	861	861
Città Fiera	Regno Unito	832	832
Città Fiera	Francia	604	604
Città Fiera	Romania	534	534
Città Fiera	Ucraina	479	479
Città Fiera	Polonia	475	475
Città Fiera	Germania	322	322
Città Fiera	Spagna	259	259
Città Fiera	Belgio	213	213
Città Fiera	Croazia	182	182
Città Fiera	Serbia	121	121
Città Fiera	Olanda	106	106



Cell phone data

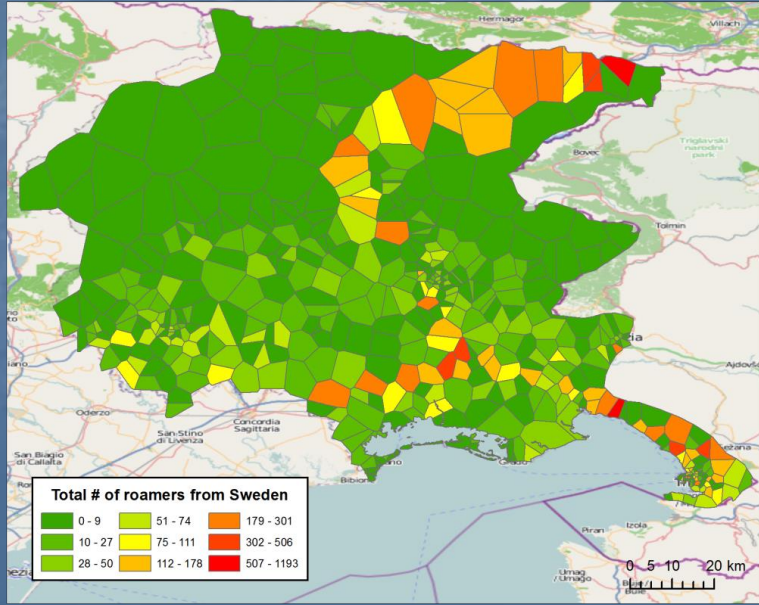
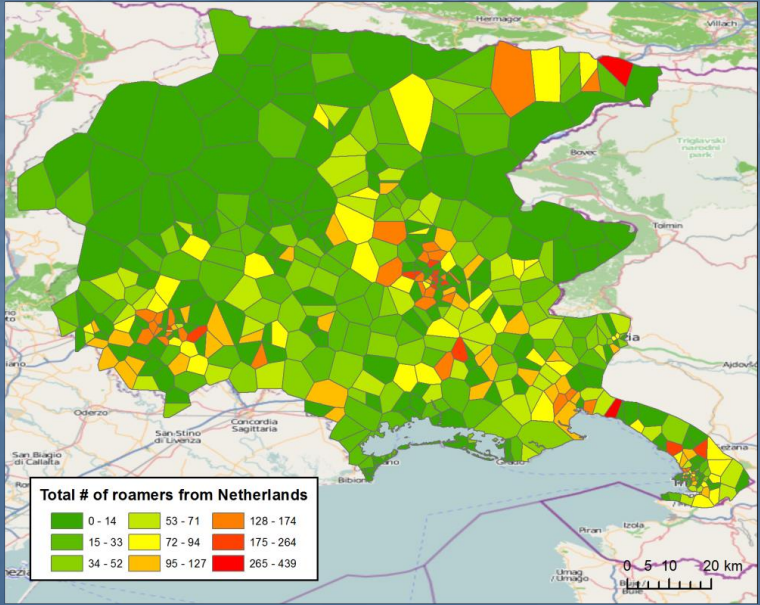
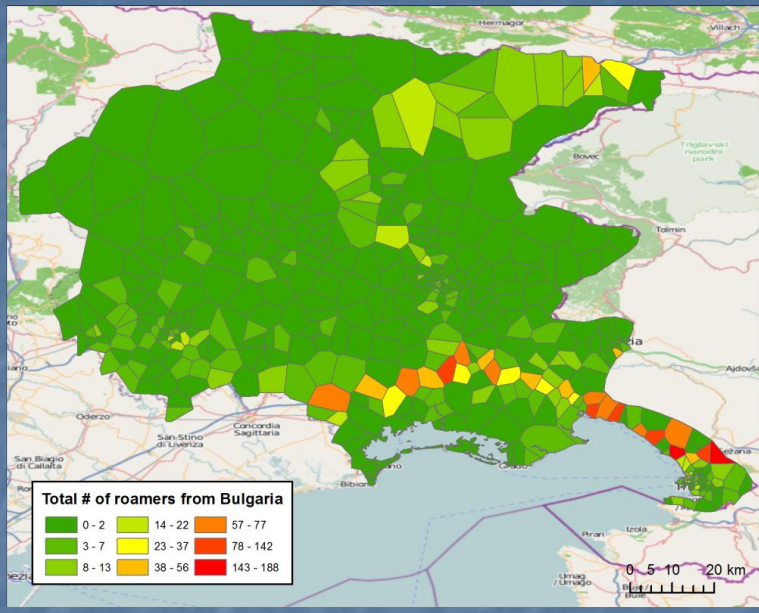
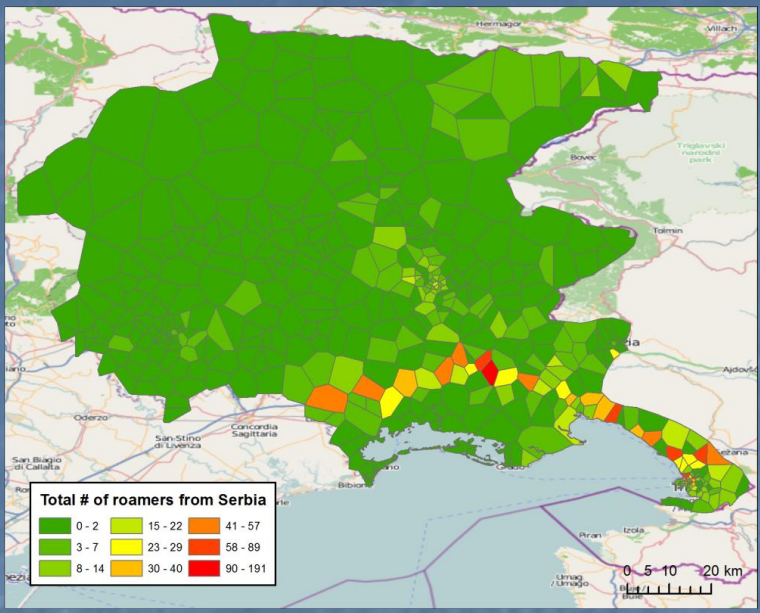


Daily life in Udine



Cell phone data

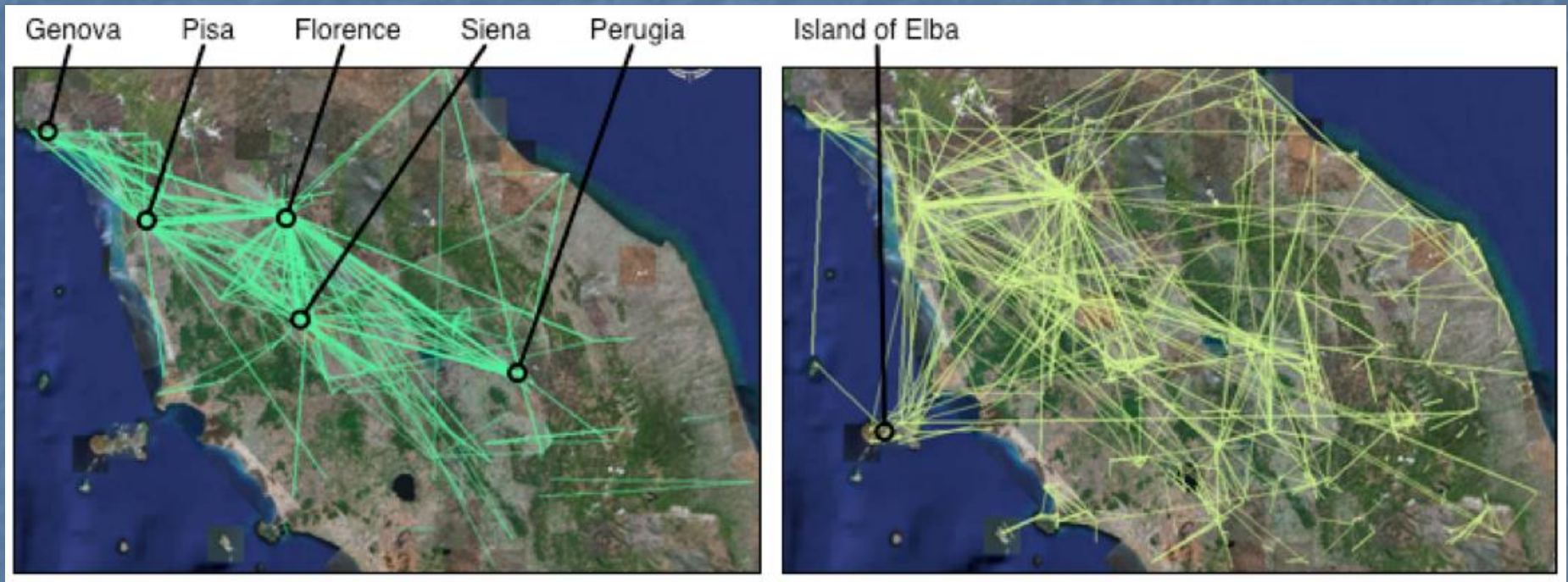
Serbian,
Bulgarian,
Dutch and
Swedish in
FVG





Cell phone data

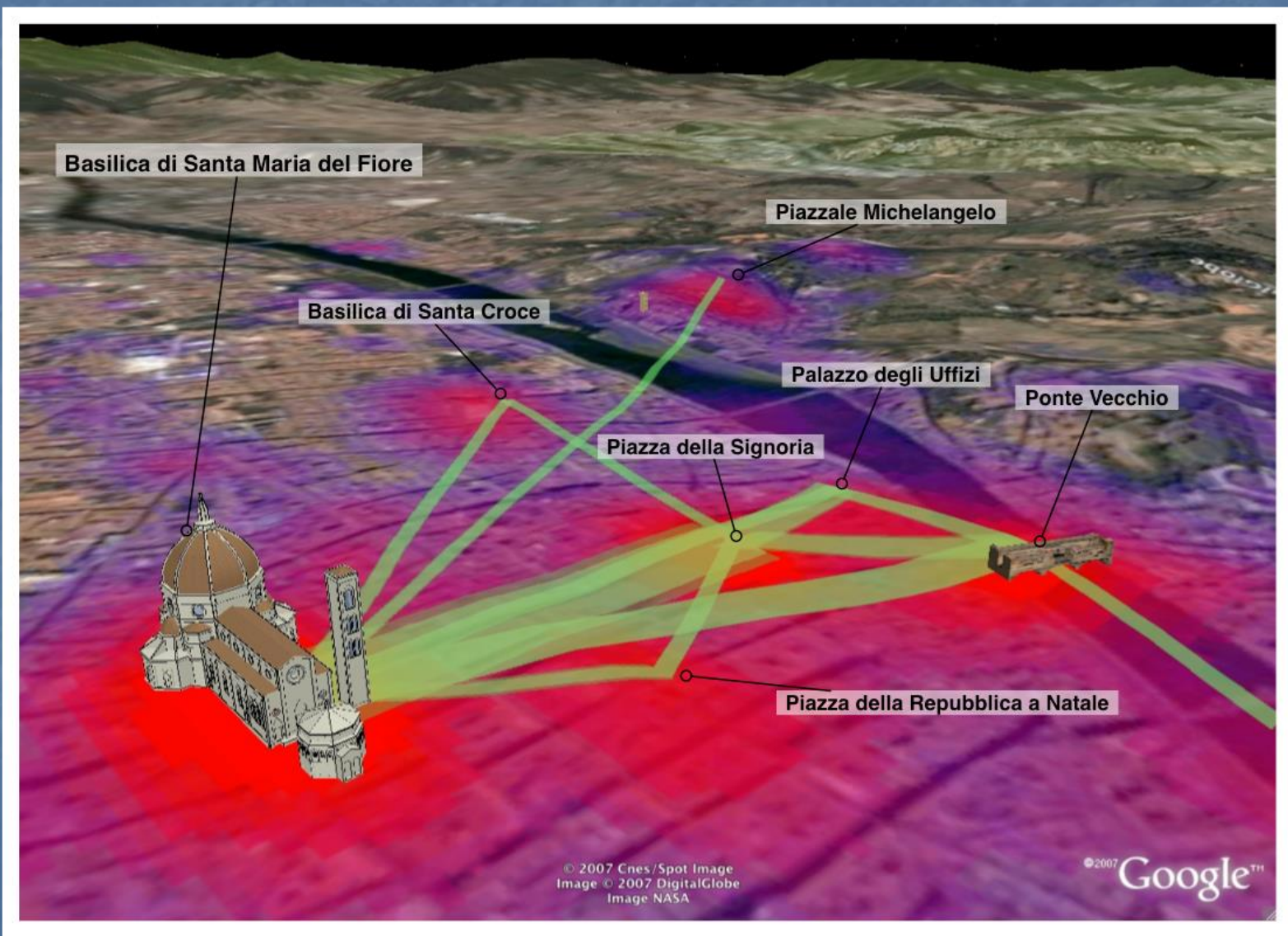
US and Italian tourist in Tuscany





Cell phone data

Foreign
paths in
Florence





Cell phone data

Municipal base simulation

data base with the following characteristics:

- period March 2016 to September 2016
- 4 records per day at 00, 06, 12, 18 time
- subdivided Italians and foreigners
- foreigners per country of origin
- Italians divided per
 - type of presence
 - resident
 - occasional visitor
 - regular visitor
 - region of provenance

More than 2 millions records

Grado Sunny Island

Analysis of Italian and foreign tourist behavior in a rainy day during the summer season

One of the most attractive seaside destination of Friuli Venezia Giulia

In 2016 approximately 400.000 arrivals (250.000 foreign)
1.600.000 presences

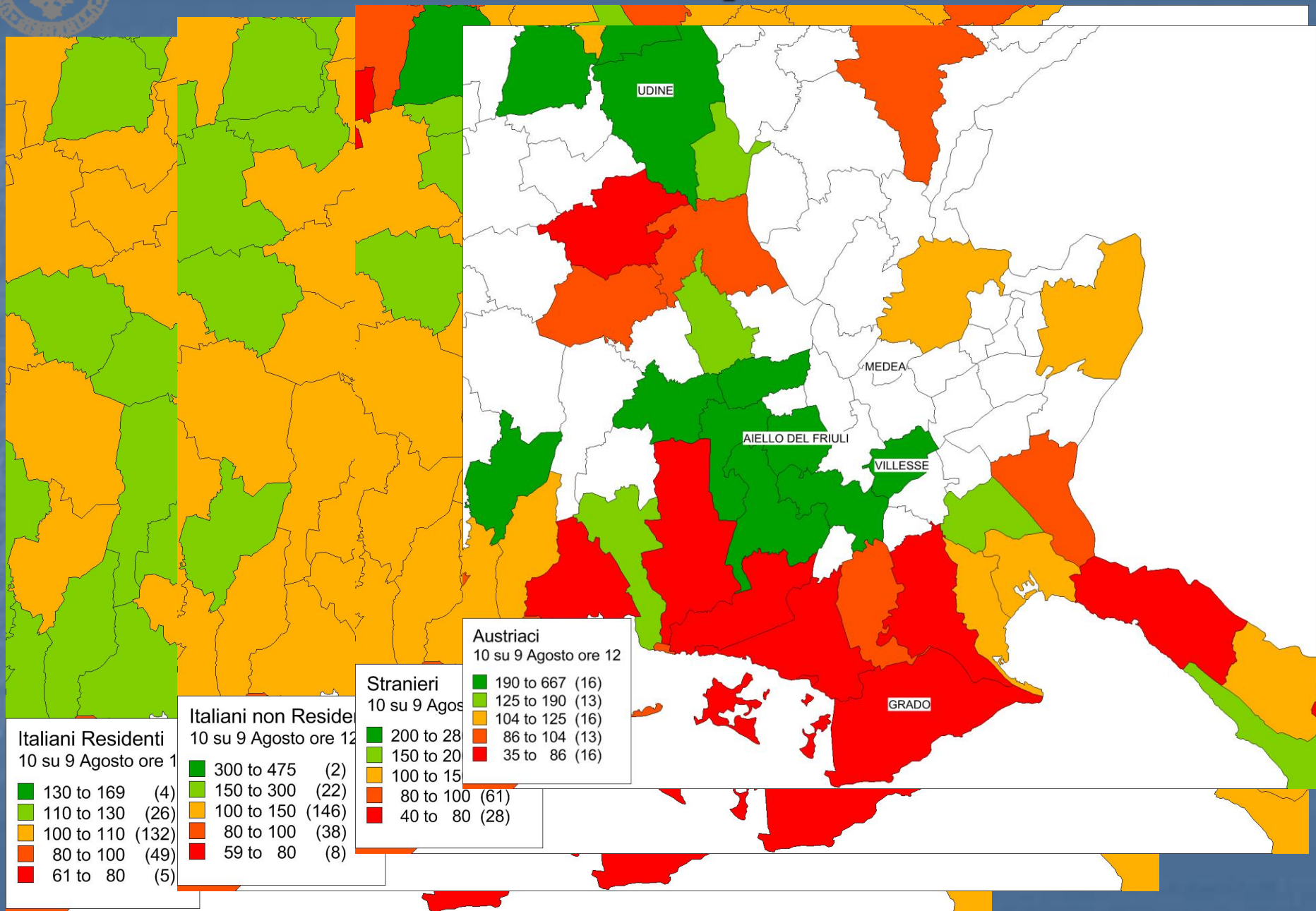
Tuesday 9th august 2016 sunny day

Wednesday 10th august 2016 rainy day

Midweek days not influenced by weekly changes and shop closures



Grado Sunny Island



Grado Sunny Island

COMUNE	ITA res.			ITA non res.			Foreign			Austrian		
	9/8	10/8	%	9/8	10/8	%	9/8	10/8	%	9/8	10/8	%
GRADO	16.201	9.997	62	5.057	3.700	73	4.768	3.721	78	1.971	1.520	77
VILLESSE	2.639	4.449	169	353	1.186	336	582	1.288	221	18	120	667
AQUILEIA	1.674	1.516	91	307	379	123	256	271	106	91	77	85
UDINE	69.480	72.909	105	3.576	4.014	112	1.179	1.874	159	127	340	268
BAGNARIA ARSA	2.656	2.993	113	283	433	153	235	428	182	14	61	436
AIELLO DEL FRIULI	1.797	2.145	119	346	961	278	607	1.648	271	47	270	574
MEDEA	365	445	122	4	19	475	17	15	88	0	0	
CAMPOLONGO TAPOGLIANO	1.114	1.526	137	167	336	201	229	391	171	0	31	

Italian

- Villesse: where a big mall with Ikea is located
- Medea: where Ara Pacis, a famous monument recalling fallen of all the wars, is located
- Udine and surrounding municipalities

Foreign

- Villesse and Bagnaria Arsa
- Aiello: famous for more than 150 sundials
- Udine: with a growth of more than 60%





Friuli DOC

four days event in the city of Udine that becomes a shop window to advertise regional culture, food, wine and crafts products

Who?

Where from?

How long?

What?

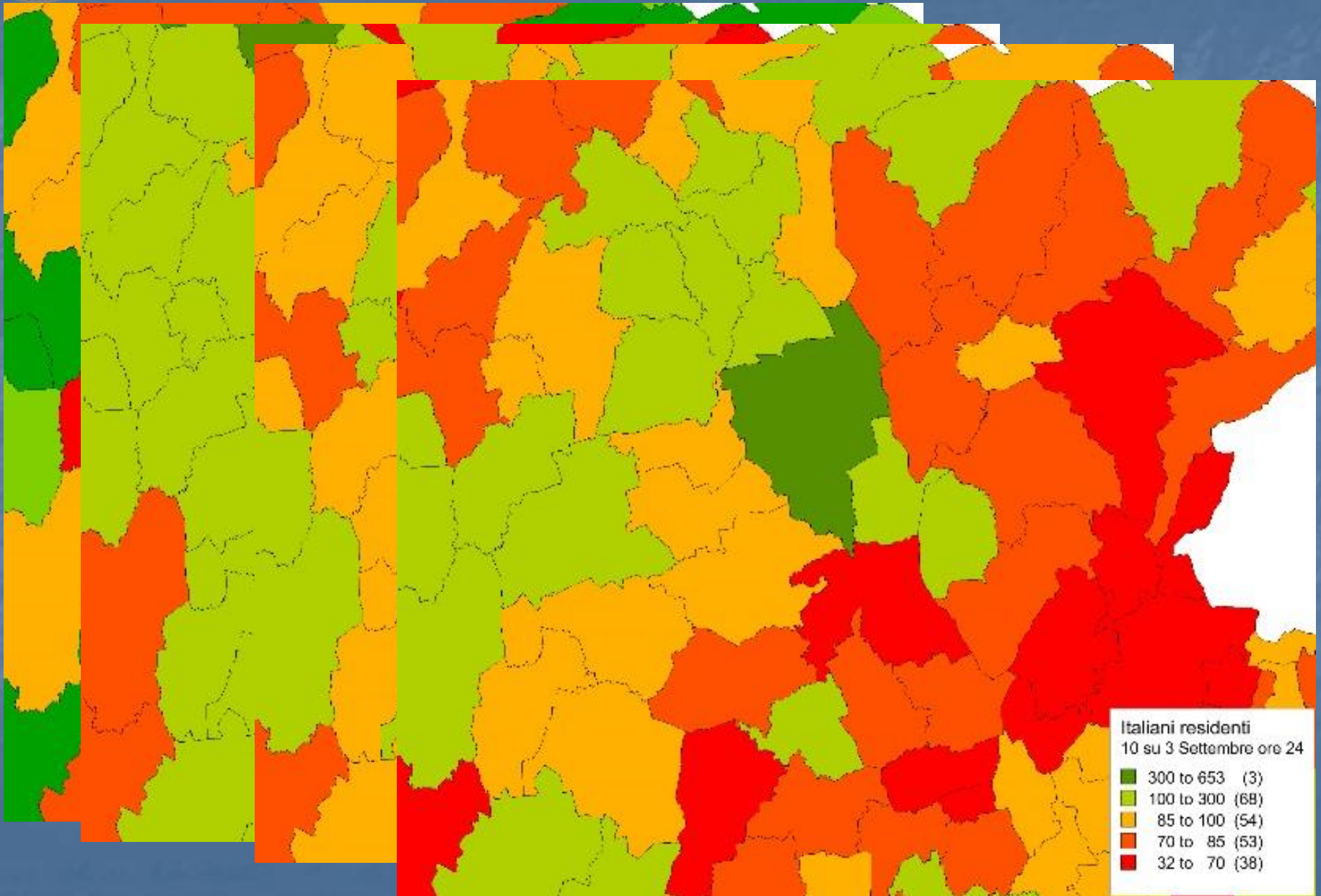
Where to?

.....





Cell phone data analysis





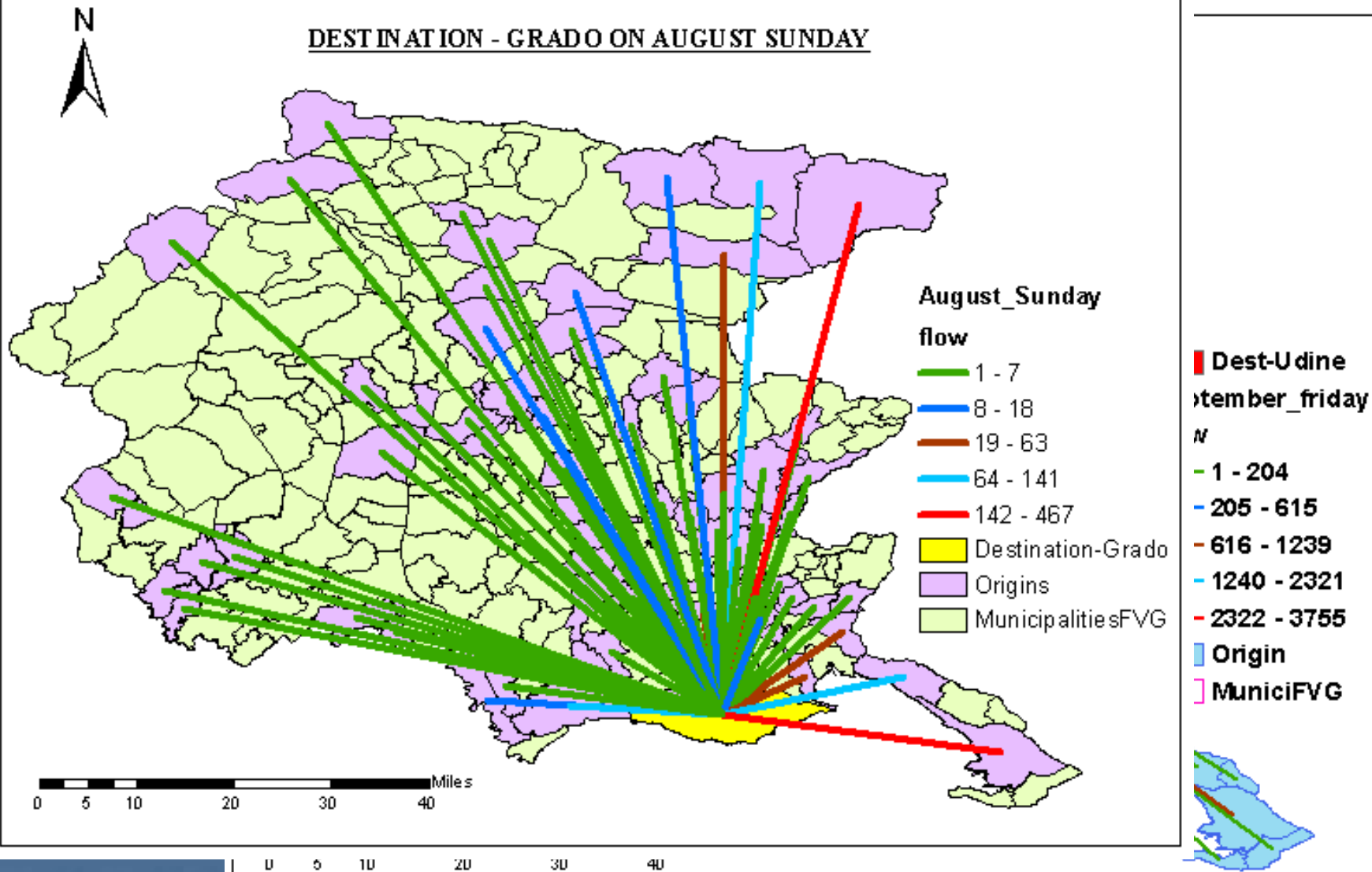
Cell phone data analysis

	Friulani		Italiani Extra Regione		Foreign	
	ore 18	ore 24	ore 18	ore 24	ore 18	ore 24
03-set	67.463	59.249	3.336	2.791	856	499
10-set	107.006	178.701	9.936	16.200	1.238	804



Cell phone data analysis

DESTINATION - GRADO ON AUGUST SUNDAY





Barcolana

The Barcolana is a historic international sailing race held every year in the Gulf of Trieste on the second Sunday of October

Since the 2018 edition, the Barcolana, with 2689 boats entered, is the largest in the world

Sunday 9 October 2016





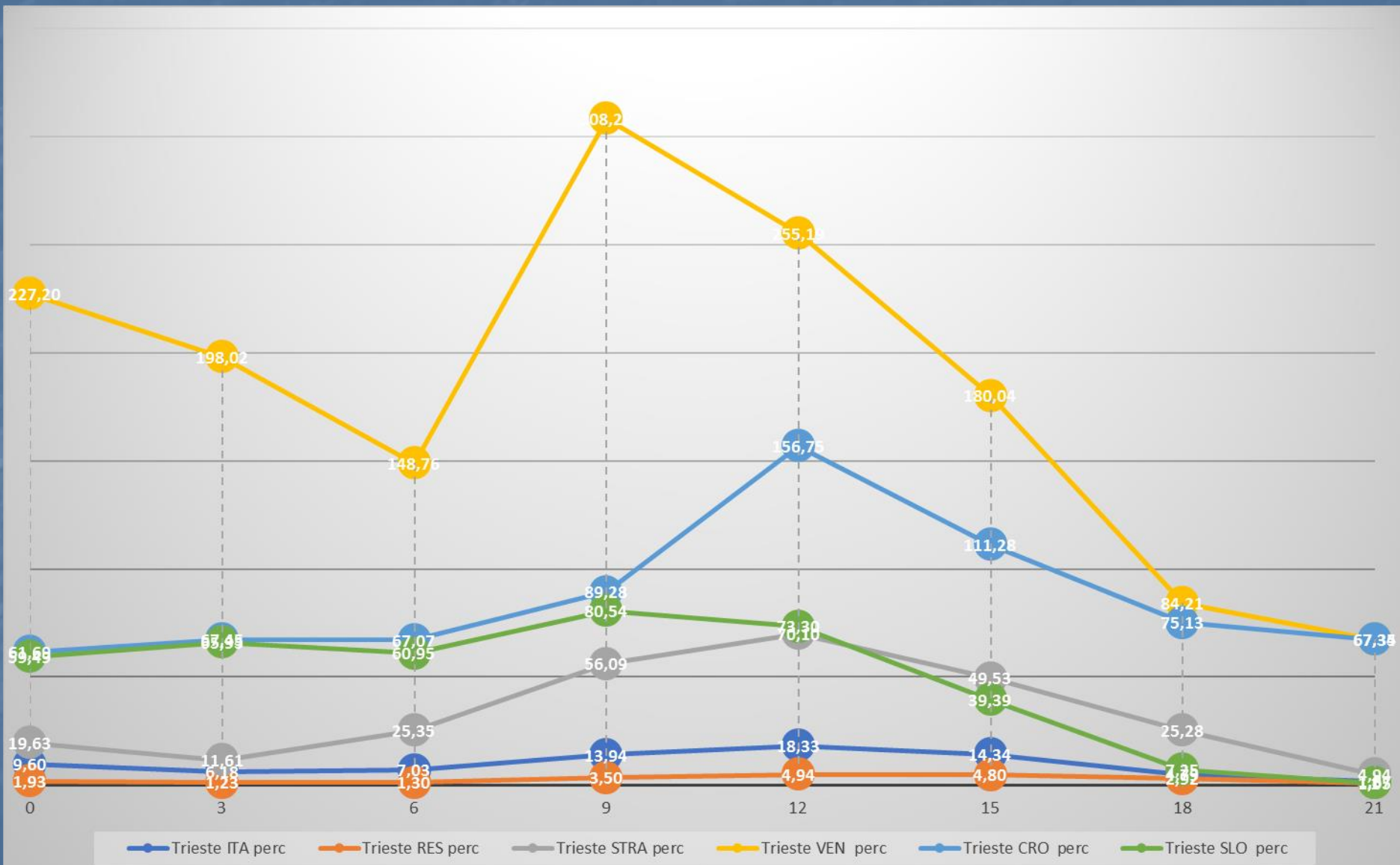
Barcolana

Competition field





Barcolana



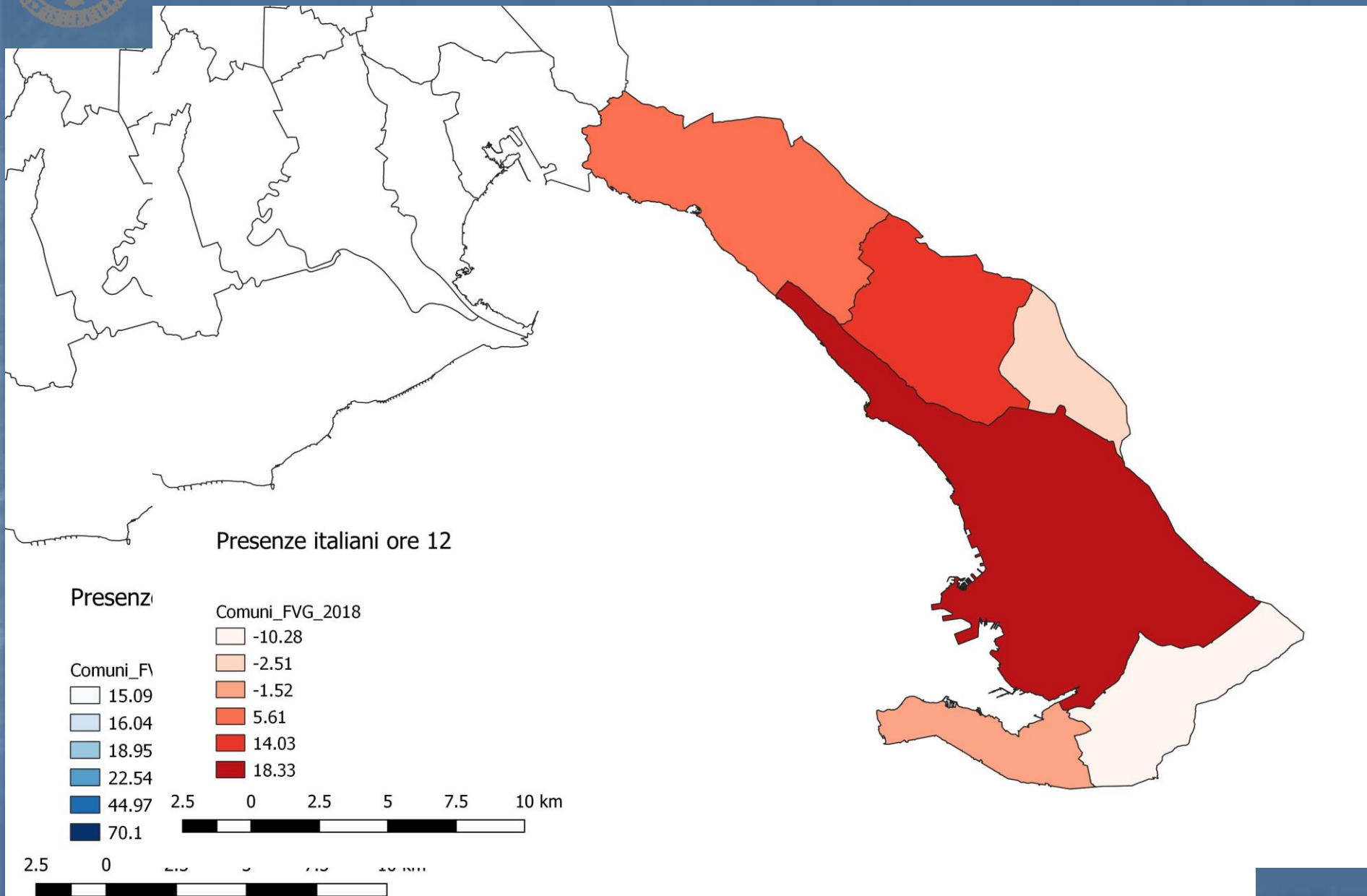


Barcolana

pro_com	0	3	6	9	12	15	18	21
Trieste 09 ITA	226.326	217.874	217.504	228.384	233.081	221.680	210.151	211.427
Trieste 16 ITA	206.508	205.195	203.225	200.444	196.978	193.873	200.536	207.538
Trieste ITA perc	9,60	6,18	7,03	13,94	18,33	14,34	4,79	1,87
Trieste 09 RES	194166	194979	190812	184188	179204	177025	184616	194.956
Trieste 16 RES	190496	192603	188368	177967	170771	168911	179379	193.265
Trieste RES perc	1,93	1,23	1,30	3,50	4,94	4,80	2,92	1
Trieste 09 STRA	6.235	5.231	7.159	12.506	14.161	12.064	8.434	5.541
Trieste 16 STRA	5.212	4.687	5.711	8.012	8.325	8.068	6.732	5.280
Trieste STRA perc	19,63	11,61	25,35	56,09	70,10	49,53	25,28	4,94
Trieste 09 VEN	5.582	4.375	4.025	7.790	9.654	7.309	2.741	1.399
Trieste 16 VEN	1.706	1.468	1.618	1.908	2.718	2.610	1.488	836
Trieste VEN perc	227,20	198,02	148,76	308,28	255,19	180,04	84,21	67,34
Trieste 09 CRO	650	571	822	1.554	1.977	1.967	1.634	974
Trieste 16 CRO	402	341	492	821	770	931	933	582
Trieste CRO perc	61,69	67,45	67,07	89,28	156,75	111,28	75,13	67,35
Trieste 09 SLO	1.008	697	1.323	3.656	4.523	3.772	2.129	869
Trieste 16 SLO	632	420	822	2.025	2.610	2.706	1.985	860
Trieste SLO perc	59,49	65,95	60,95	80,54	73,30	39,39	7,25	1,05



Barcolana





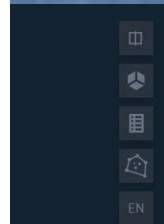
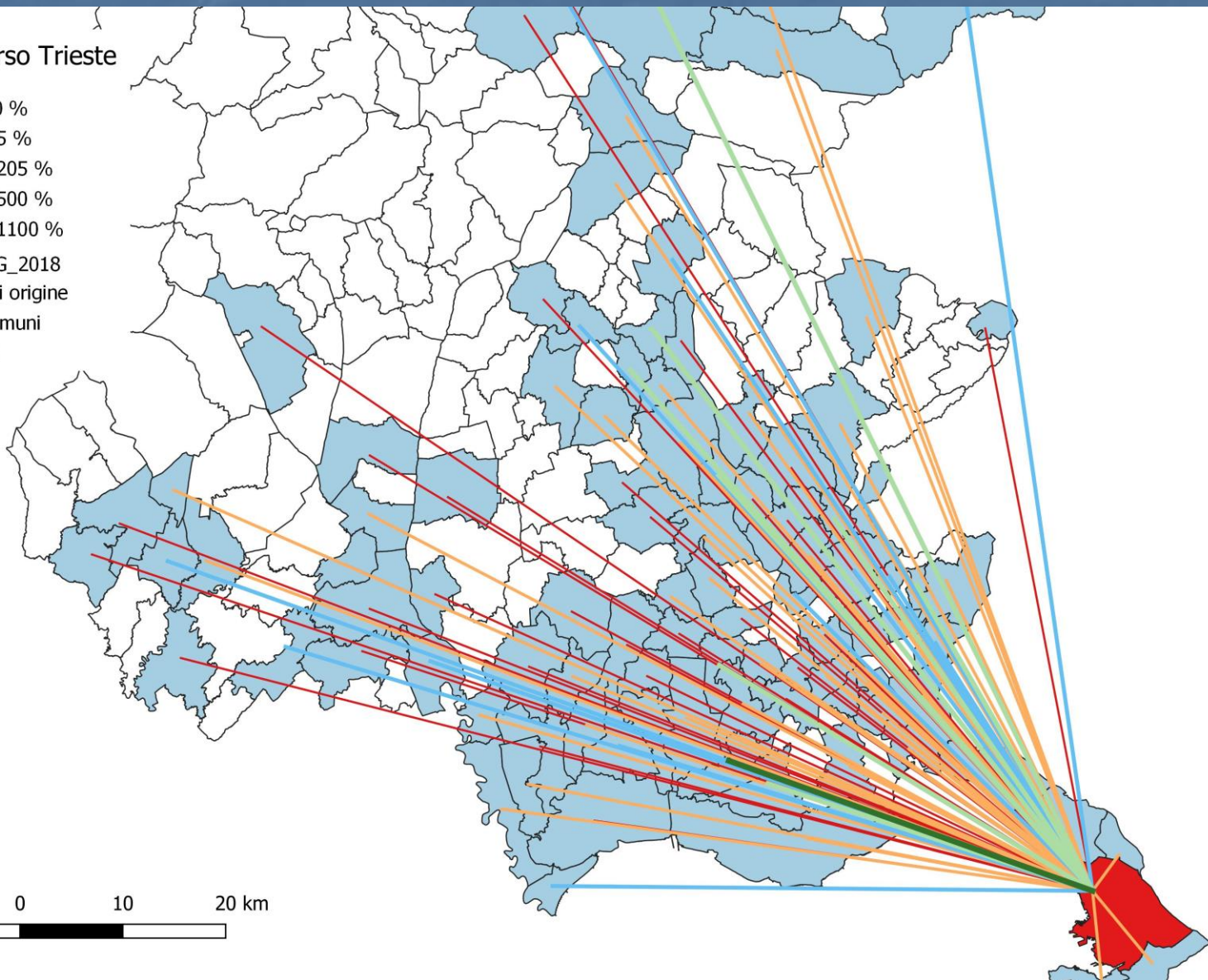
Barcolana OD

Flussi verso Trieste

- 67 - 0 %
- 0 - 125 %
- 125 - 205 %
- 205 - 500 %
- 500 - 1100 %

Comuni_FVG_2018

- Comuni origine
- Altri comuni
- Trieste



North
Antic
ean



Problems and opportunities

Data to information

The MORE **data** available is NOT always MORE **information**

Cell phone data companies willingness to do analysis themselves

Awareness of Private Companies and Public Administration

Real timing

ex: depending on the meteo forecast tomorrow change the timetable of public transportation



THANK YOU

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