



TomTom



Traffic Bottleneck Analysis and Real-Time Traffic Services

ESRI European Congress 2014

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Congestion is a global problem



Top 3 - Increasing congestion

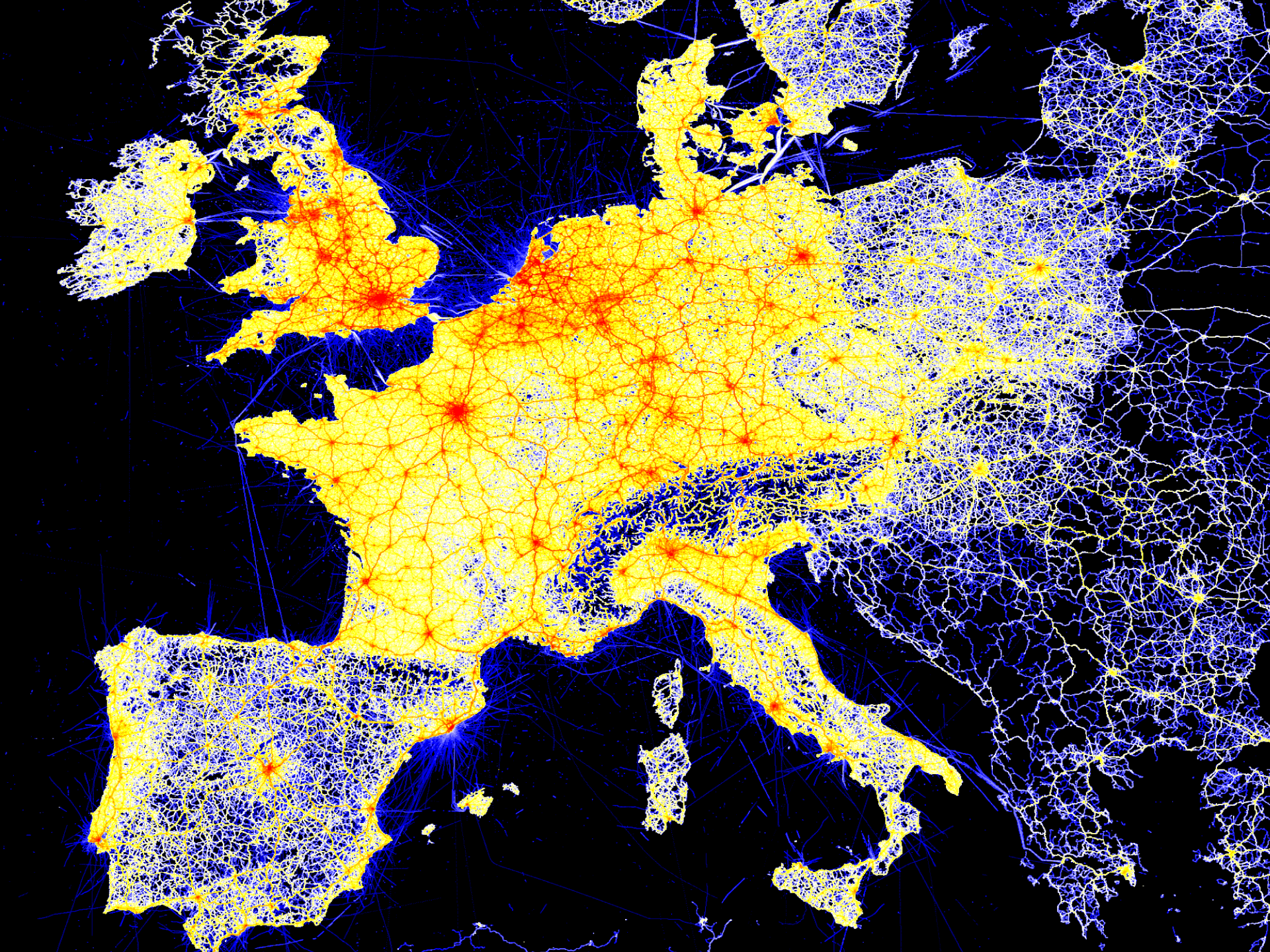


Top 3 - Decreasing congestion



The worst 20 cities in 2013

Rank	CI change	City	Country	Congestion	Morning peak	Evening peak	Highways	Non-Highways
1	▼	Moscow	Russia	74%	111%	141%	79%	72%
2	▲	Istanbul	Turkey	62%	87%	129%	73%	54%
3	---	Palermo	Italy	39%	60%	64%	29%	45%
4	▼	Warsaw	Poland	39%	71%	75%	37%	41%
5	▼	Rome	Italy	37%	71%	64%	26%	41%
6	▼	Dublin	Ireland	35%	74%	71%	27%	42%
7	▼	Marseille	France	35%	60%	70%	20%	41%
8	---	Paris	France	35%	65%	65%	35%	35%
9	▲	London	United Kingdom	34%	60%	63%	22%	40%
10	▼	Athens	Greece	34%	54%	49%	14%	40%
11	▲	Brussels	Belgium	34%	73%	77%	31%	36%
12	---	Stockholm	Sweden	30%	59%	66%	27%	33%
13	▼	Stuttgart	Germany	29%	49%	60%	28%	31%
14	---	Naples	Italy	28%	43%	50%	13%	40%
15	▼	Hamburg	Germany	28%	45%	49%	22%	32%
16	---	Vienna	Austria	28%	44%	50%	18%	33%
17	▲	Prague	Czech Republic	28%	57%	48%	22%	31%
18	▼	Berlin	Germany	27%	42%	49%	24%	30%
19	---	Milan	Italy	27%	62%	52%	17%	33%
20	▲	Lyon	France	27%	55%	53%	22%	31%



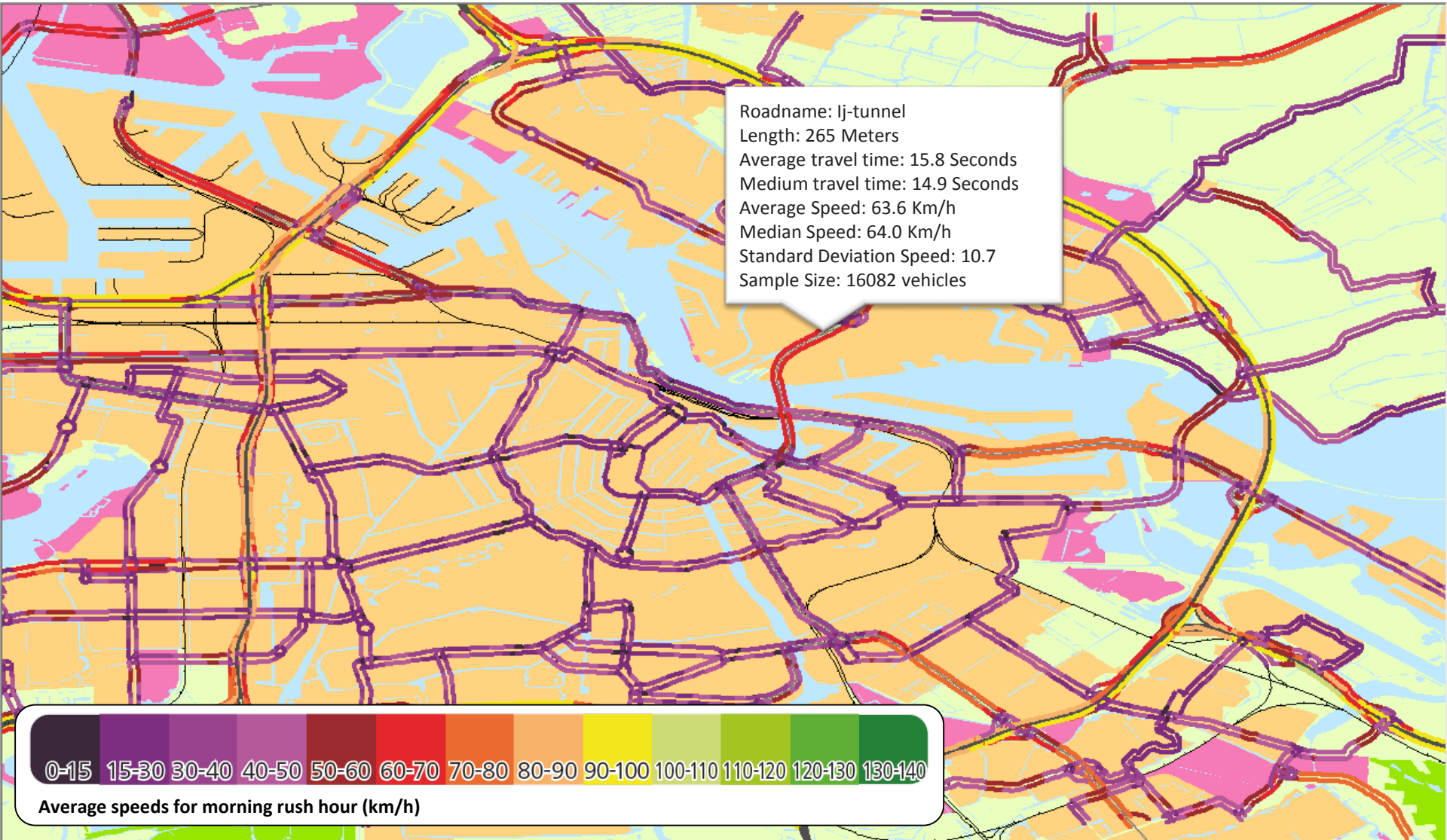


Traffic Bottleneck Analysis

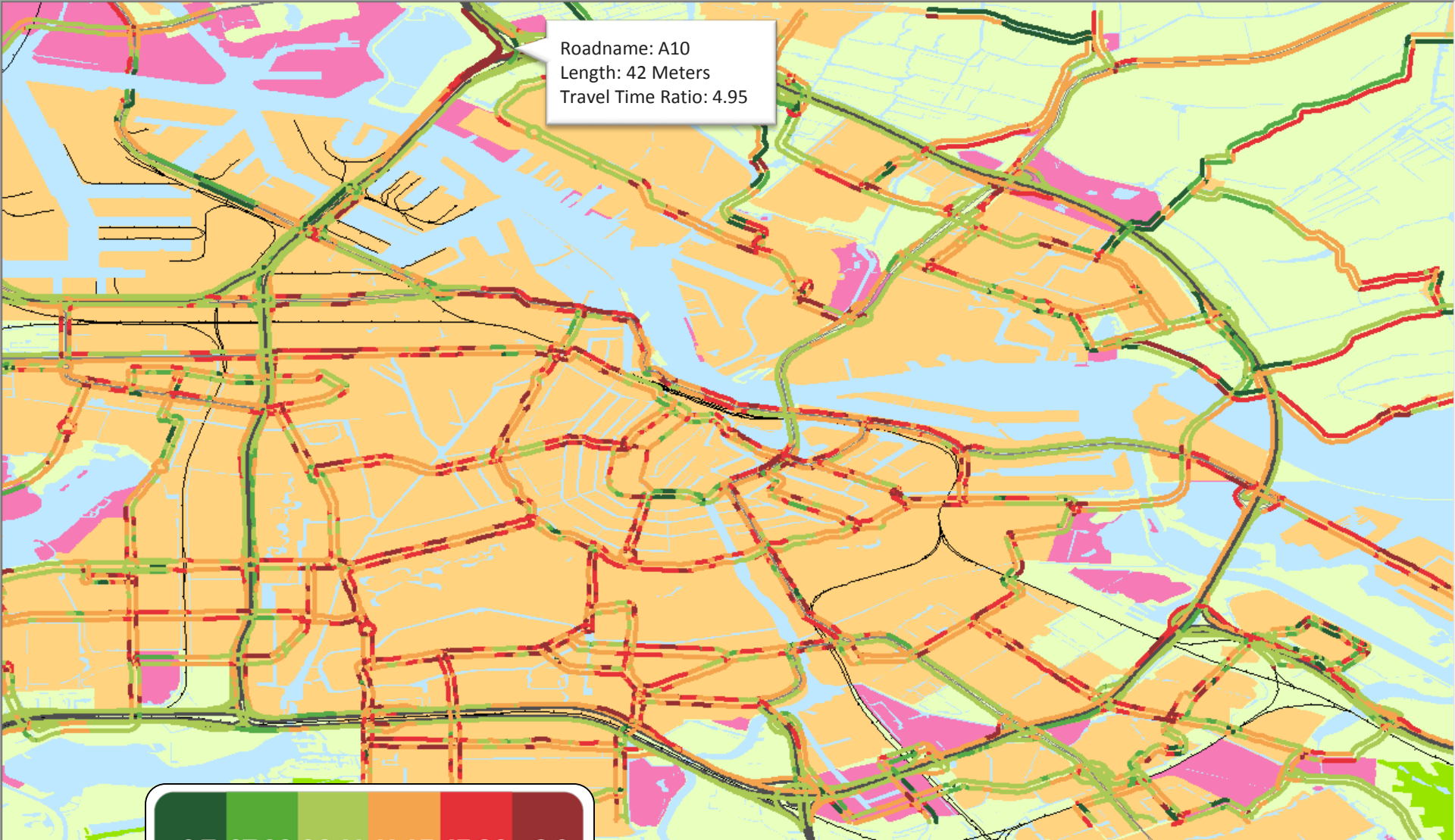
Floating Car Data provides new opportunities



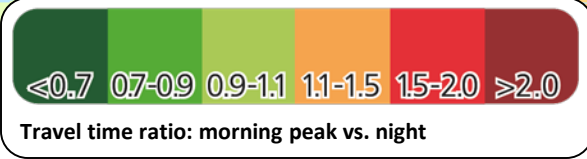
Example Speed Analysis for Amsterdam



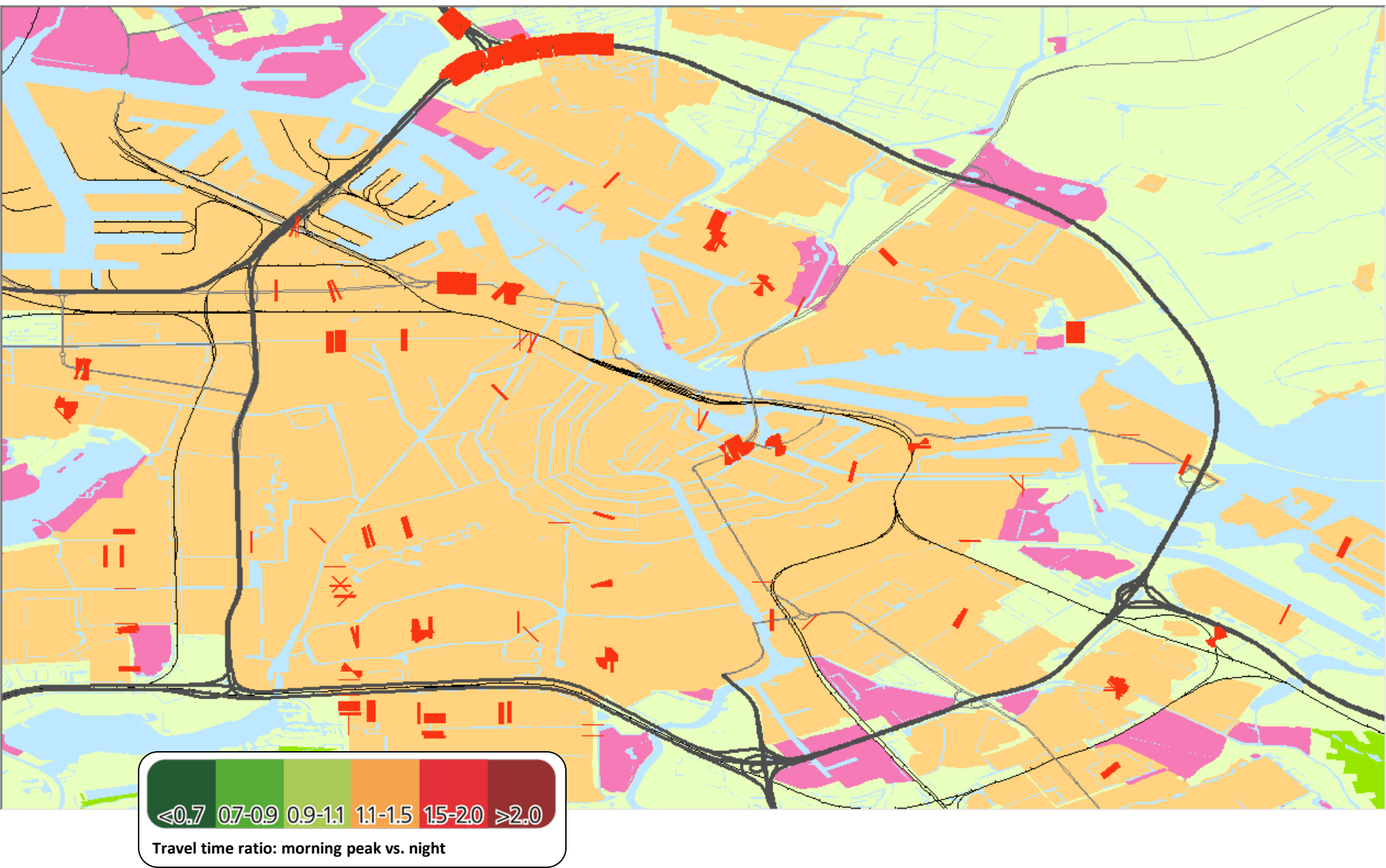
Example Congestion Analysis for Amsterdam



Roadname: A10
Length: 42 Meters
Travel Time Ratio: 4.95



Example Congestion Analysis for Amsterdam





Analysis Example Italy

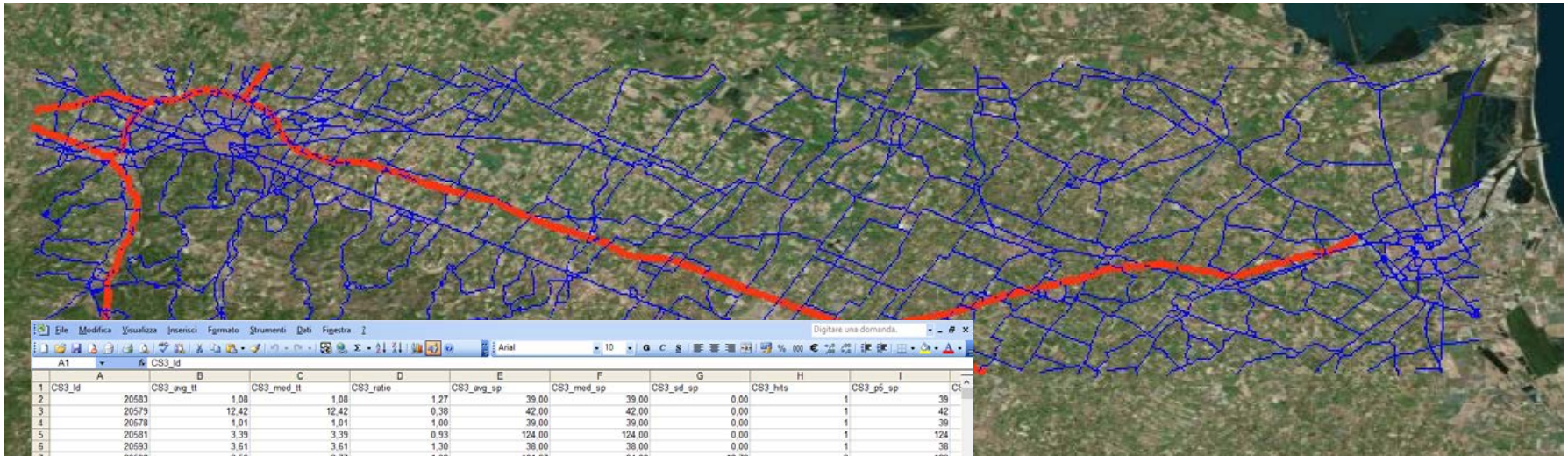
Case Study Citilabs - SPEA

Where: A14 Bologna S.Lazzaro – Castel S.Pietro
Castel S.Pietro – Imola
Imola – Dir.Ravenna

When: 2012, October #1
2012, August, 15 #2

What: SPEA – vehicular data of vehicle types: cars, motorcycles, caravan, trucks under 3,5 tons, collected by Tutor portals
TomTom – vehicular data collected by millions of TomTom navigation device, mainly from *In car Dash Navigation*

Purpose: compare data provided by SPEA and data derived from TomTom Floating car Data. This in order check the validity of Floating Car Data



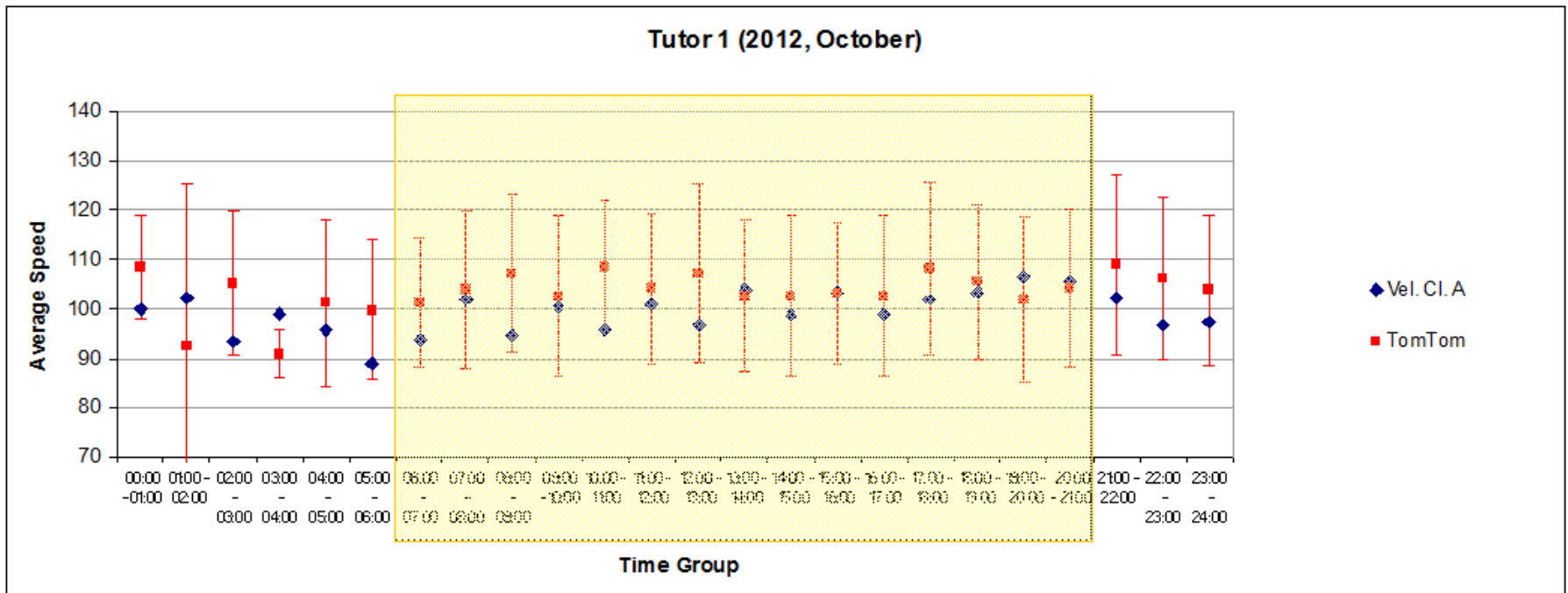
	A	B	C	D	E	F	G	H	I	J
1	CS3_id	CS3_avg_ft	CS3_med_ft	CS3_ratio	CS3_avg_sp	CS3_med_sp	CS3_sd_sp	CS3_hits	CS3_p5_sp	CS3_p95_sp
2	20583	1.08	1.08	1.27	39.00	39.00	0.00	1	39	39
3	20579	12.42	12.42	0.30	42.00	42.00	0.00	1	42	42
4	20578	1.01	1.01	1.00	39.00	39.00	0.00	1	39	39
5	20581	3.39	3.39	0.93	124.00	124.00	0.00	1	124	124
6	20593	3.61	3.61	1.30	38.00	38.00	0.00	1	38	38
7	20592	3.56	3.77	1.08	101.67	94.00	18.72	3	123	123
8	10738	1.09	0.94	1.08	93.80	104.00	20.14	6	111	111
9	10733	0.96	0.96	0.69	124.00	124.00	0.00	1	124	124
10	10752	1.55	1.31	1.07	84.40	107.00	20.56	5	111	111
11	10771	0.95	0.86	1.03	98.80	107.00	16.13	5	113	113
12	10769	0.77	0.77	0.90	123.00	123.00	0.00	1	123	123
13	489	2.60	2.60	0.79	140.00	140.00	0.00	1	140	140
14	506	0.91	0.91	0.82	134.00	134.00	0.00	1	134	134
15	10767	5.84	5.14	1.04	97.00	124.00	16.13	5	113	113
16	504	0.61	0.61	0.79	140.00	140.00	0.00	1	140	140
17	10764	5.42	5.42	0.70	122.00	122.00	0.00	1	122	122
18	10782	0.24	0.24	0.64	127.00	127.00	0.00	1	127	127
19	10781	2.51	2.51	0.86	122.00	122.00	0.00	1	122	122
20	513	2.00	2.00	0.85	128.00	128.00	0.00	1	128	128
21	10780	0.31	0.31	0.64	127.00	127.00	0.00	1	127	127
22	10779	2.04	1.85	1.03	89.20	107.00	20.56	5	111	111
23	10777	0.54	0.54	0.63	126.00	126.00	0.00	1	126	126
24	10776	1.76	1.76	0.66	126.00	126.00	0.00	1	126	126
25	519	0.57	0.57	0.85	128.00	128.00	0.00	1	128	128
26	10772	1.62	1.62	0.89	123.00	123.00	0.00	1	123	123
27	10800	0.36	0.36	0.64	126.00	126.00	0.00	1	126	126
28	446	4.89	4.89	0.78	140.00	140.00	0.00	1	140	140
29	10792	0.53	0.53	0.64	126.00	126.00	0.00	1	126	126
30	10812	1.58	1.43	1.01	101.20	107.00	20.56	5	111	111
31	10807	3.10	2.81	1.01	101.20	107.00	20.56	5	111	111
32	10808	6.80	6.80	0.88	122.00	122.00	0.00	1	122	122
33	10871	9.88	9.88	0.84	76.00	76.00	0.00	1	76	76

Table

Op	BS id	BS avg ft	BS med ft	BS avg sp	BS med sp	BS sd sp	BS hits	BS p5 sp	BS p10 sp	BS p15 sp	BS p20 sp	BS p25 sp	BS p30 sp
0	8967	2.2	2.2	59	59	0	1	59	59	59	59	59	59
1	32692	8.68	8.68	35	35	0	1	35	35	35	35	35	35
2	10814	3.52	3.52	59	59	0	1	59	59	59	59	59	59
3	8968	4.37	4.37	55	55	0	1	55	55	55	55	55	55
4	10817	2.59	2.59	59	59	0	1	59	59	59	59	59	59
5	42601	1	1	93	93	0	1	93	93	93	93	93	93
6	10821	0.48	0.48	60	60	0	1	60	60	60	60	60	60
7	10823	3.08	3.08	59	59	0	1	59	59	59	59	59	59
8	10826	2.17	2.17	54	54	0	1	54	54	54	54	54	54
9	12215	2.29	2.29	55	55	0	1	55	55	55	55	55	55
10	12216	2.44	2.25	52	56	5.66	2	56	56	56	56	56	56
11	12213	1.42	1.42	55	55	0	1	55	55	55	55	55	55
12	12214	1.51	1.4	52	56	5.66	2	56	56	56	56	56	56
13	10829	2.16	2.16	54	54	0	1	54	54	54	54	54	54
14	42620	5.08	5.08	36	36	0	1	36	36	36	36	36	36
15	42616	3.84	3.34	46	52	8.49	2	52	52	52	52	52	52
16	12220	1.77	1.77	57	57	0	1	57	57	57	57	57	57
17	12219	1.84	1.84	55	55	0	1	55	55	55	55	55	55
18	42607	0.77	0.77	93	93	0	1	93	93	93	93	93	93
19	12218	1.65	1.65	57	57	0	1	57	57	57	57	57	57

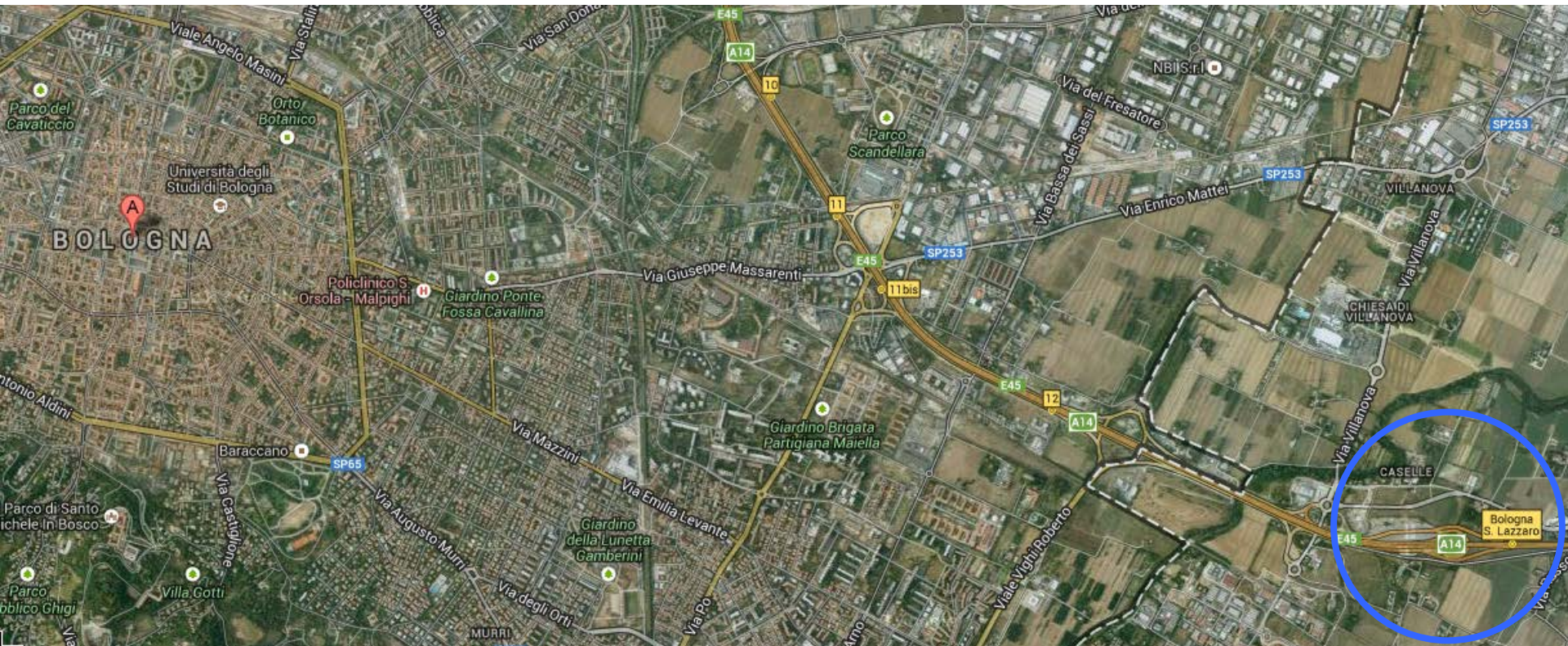
(0 out of 32761 Selected)

The data is compared for a specific segment. Speed data from the Ground Loops (Vel. Cl. A) are compared with Floating Car Data (TomTom)

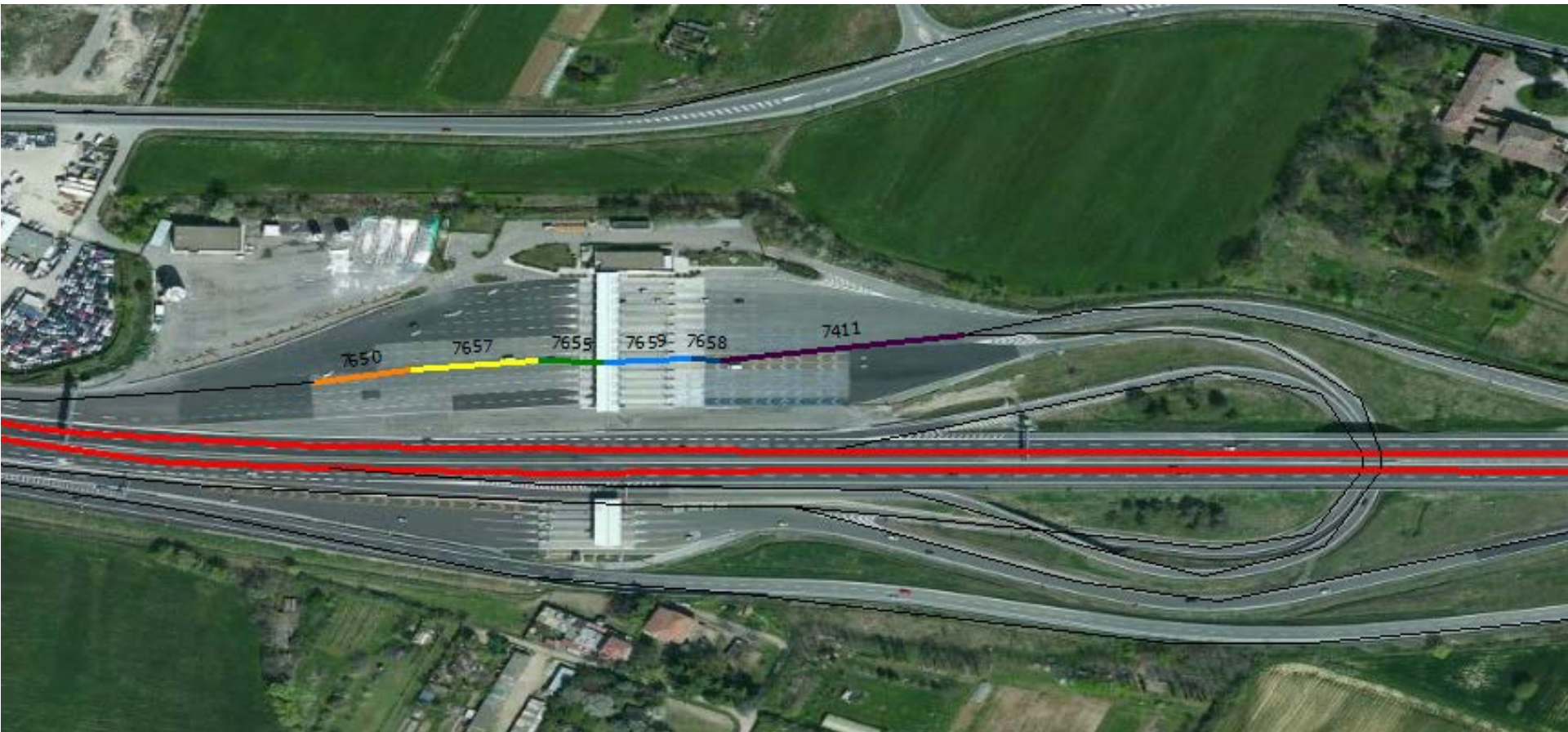


Central time zone of the day is highlighted in yellow, from 06:00 to 21:00

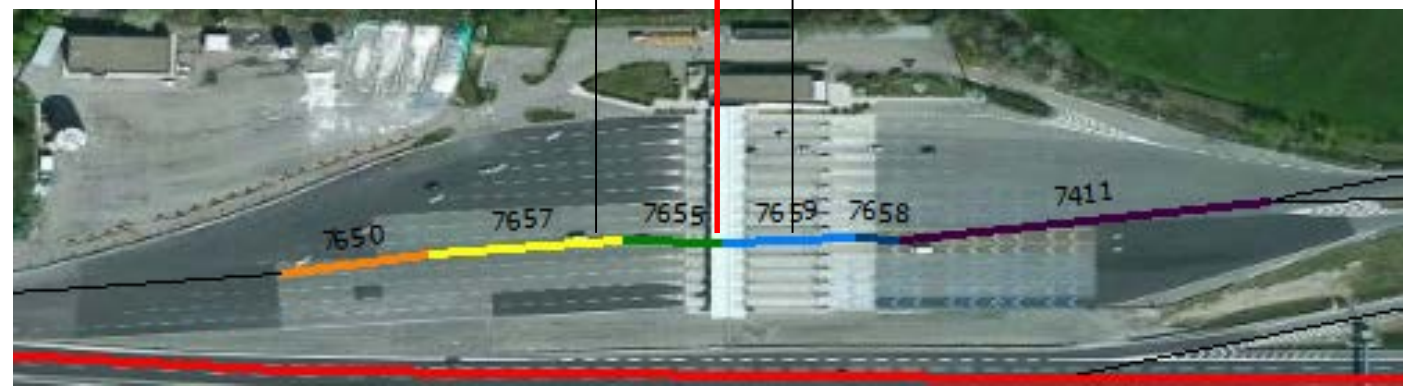
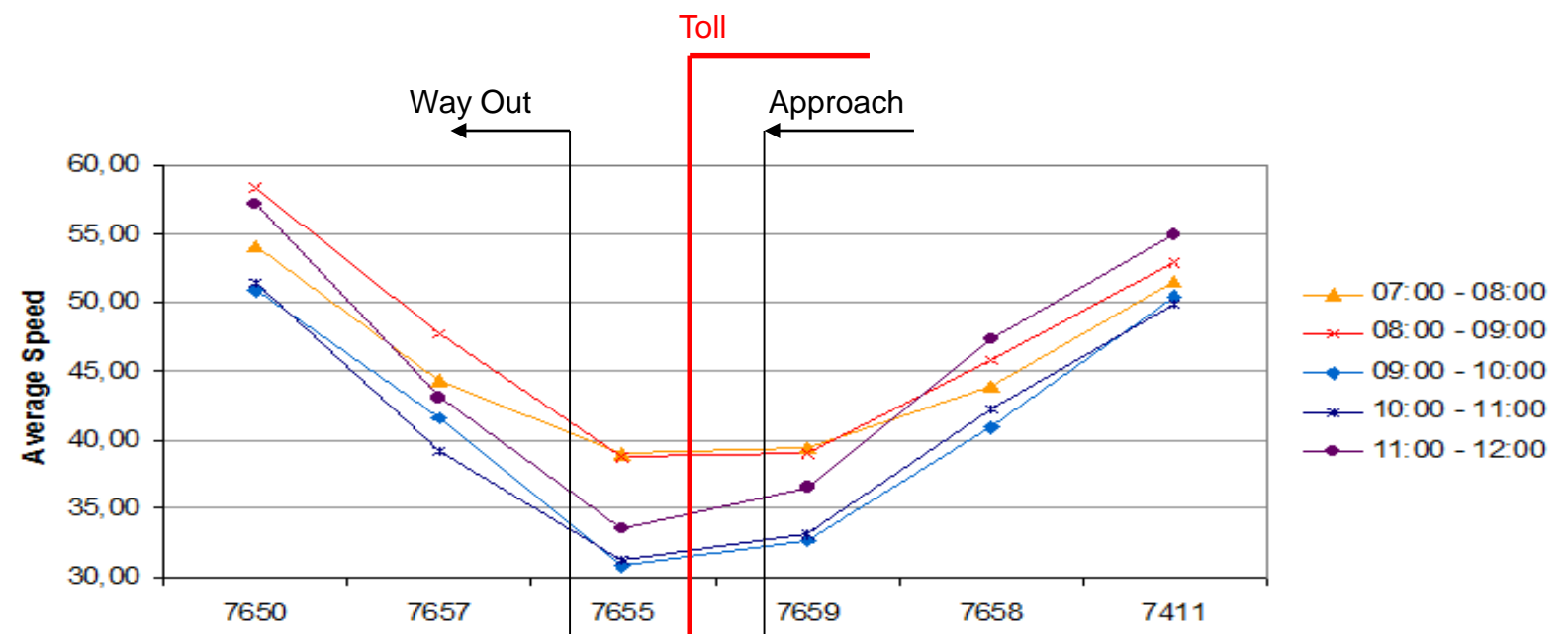
Non-Loop analysis number 1
Approach to the Bologna San Lazzaro toll booth (dir. Bologna)



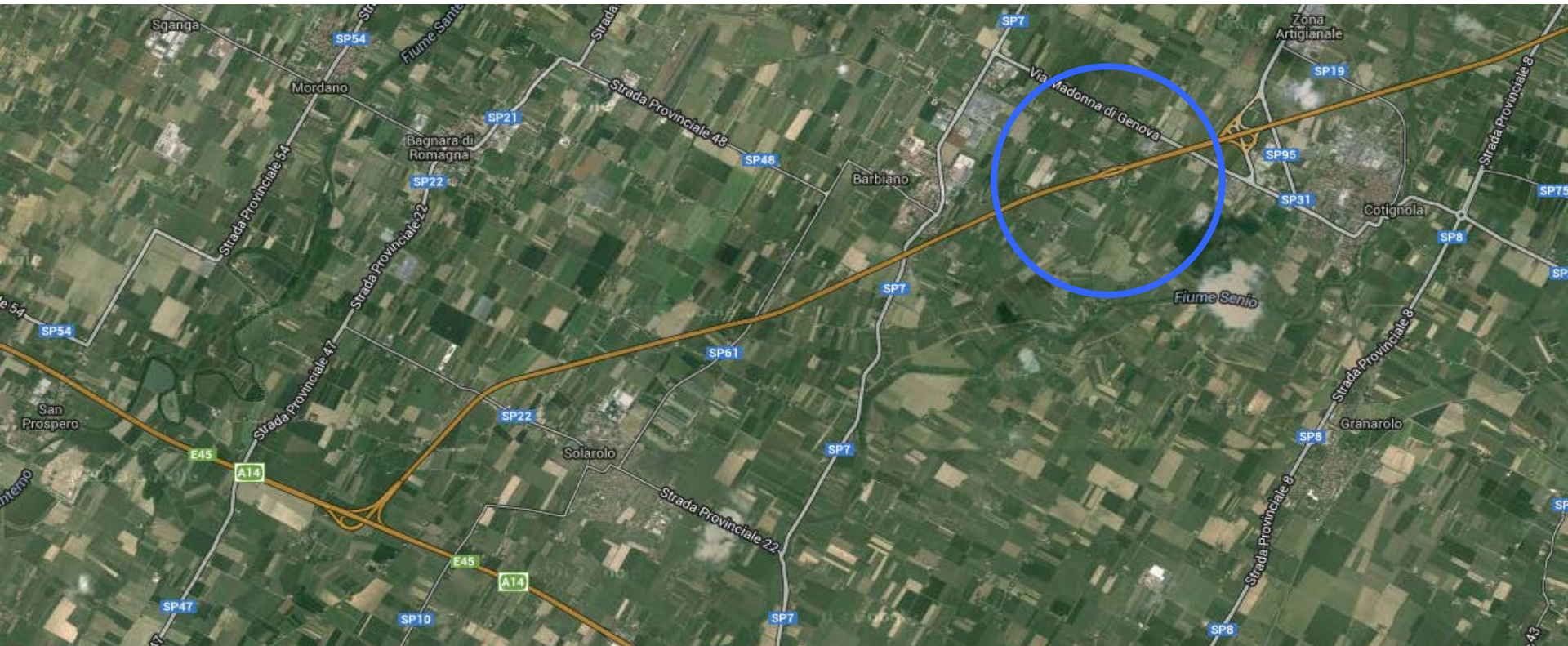
Selection of segments of interest from TomTom shapefile



Analysis of TomTom average speed data in the approach, the transit and in the way out from of the toll booth

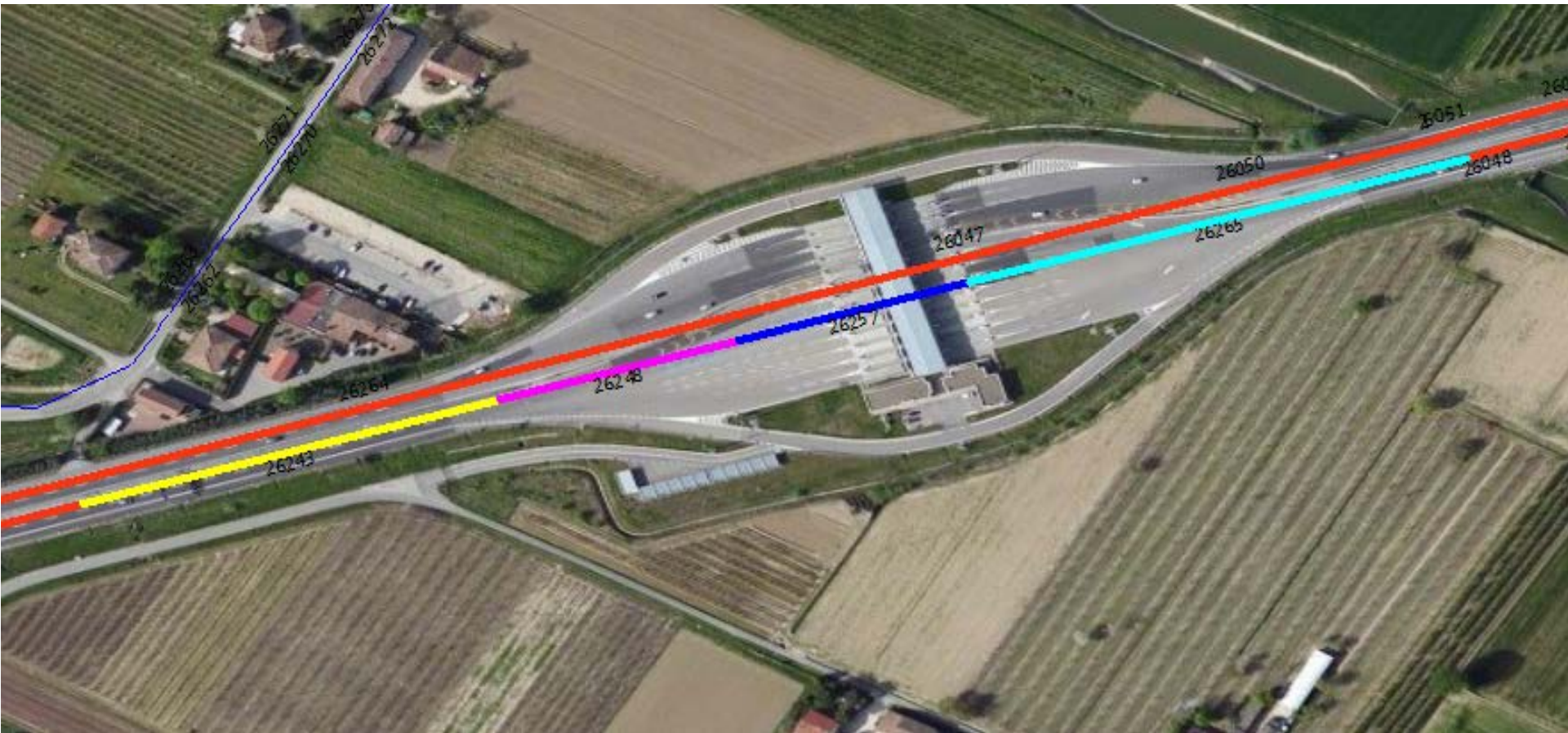


Non-Loop analysis number 2
Approach to the Ravenna Barrier toll booth (dir. Ravenna)

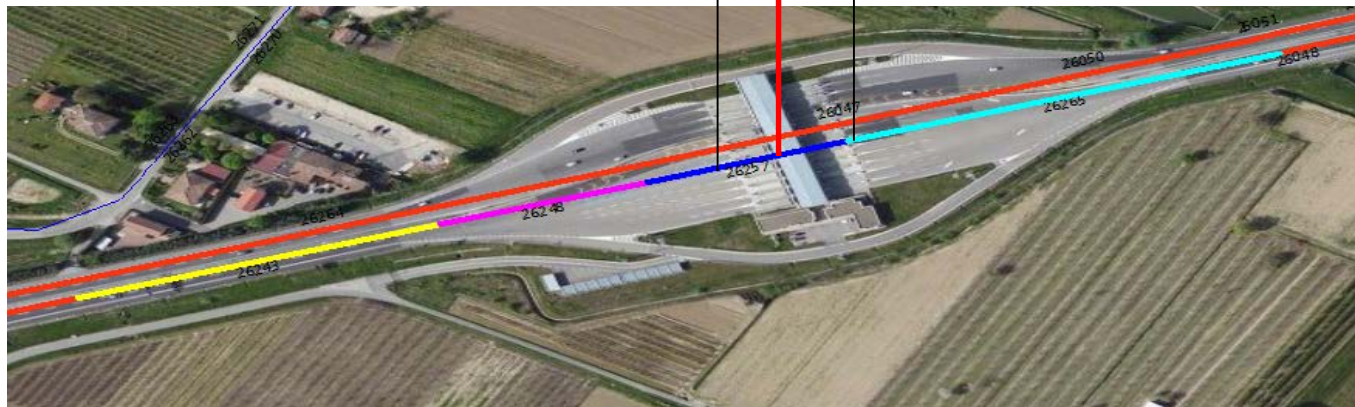
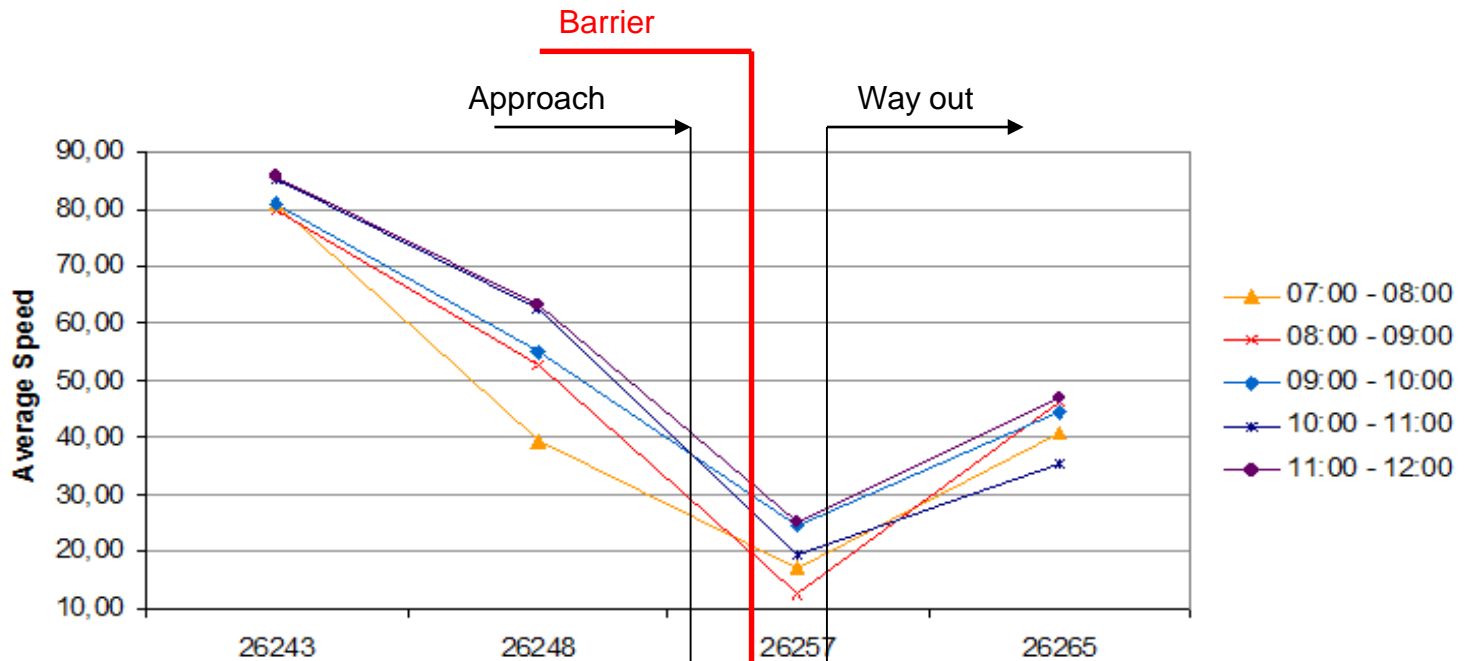


Analysis of a situation on interest #2
approach to the Ravenna barrier (dir. Ravenna, 2012 August 15)

Selection of segments of interest from TomTom shapefile



Analysis of TomTom average speed data in the approach, the transit and in the way out from of the toll booth



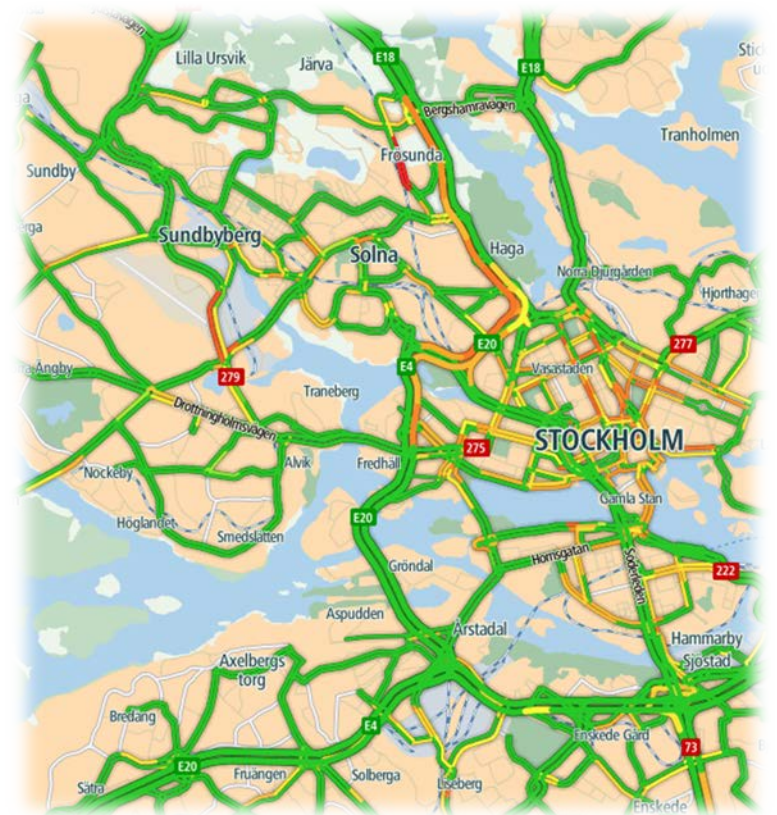
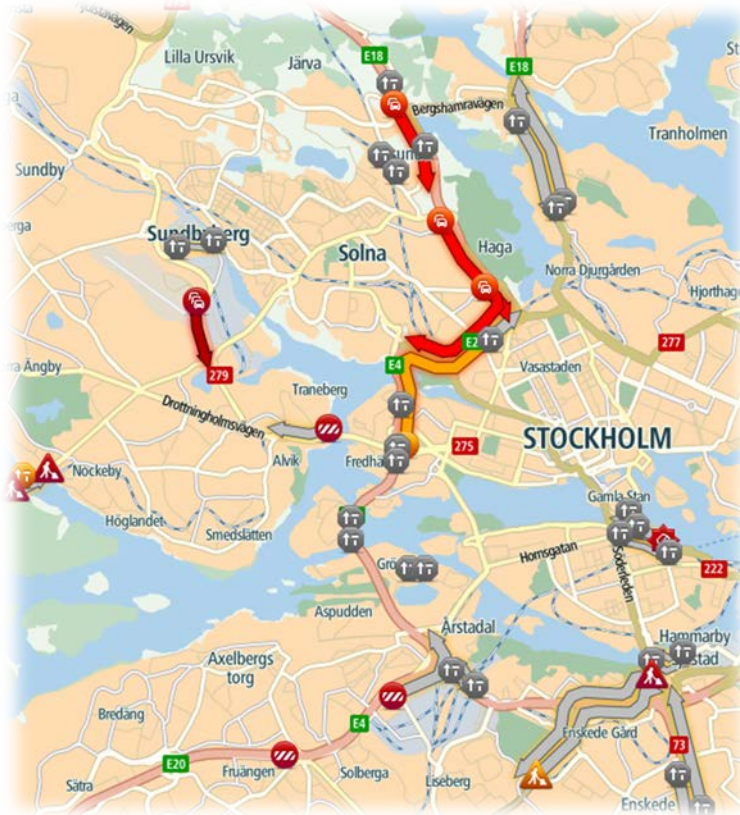


Real-Time Traffic Services

Real Time Probe Data



Traffic Incidents and Traffic Flow



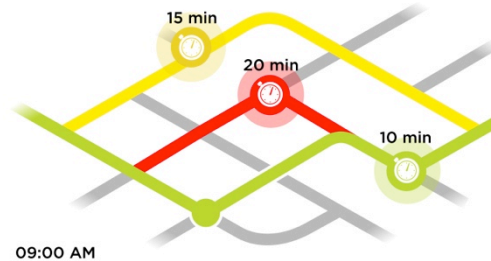
- File contains information ONLY for the road stretches affected by incident/congestion
- Accurate delay, start and end location

- Current speed information on all relevant roads – both congested and freeflow
- Easy GIS integration

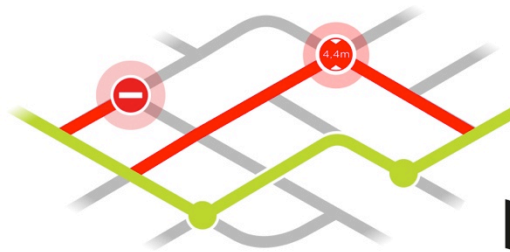
The 4 steps in accurate routing



1. **Base maps**
2. Map Share
3. Speed Profiles
4. TomTom Traffic



4. TomTom Traffic
- 3. Speed Profiles**
2. Map Share
1. Base maps

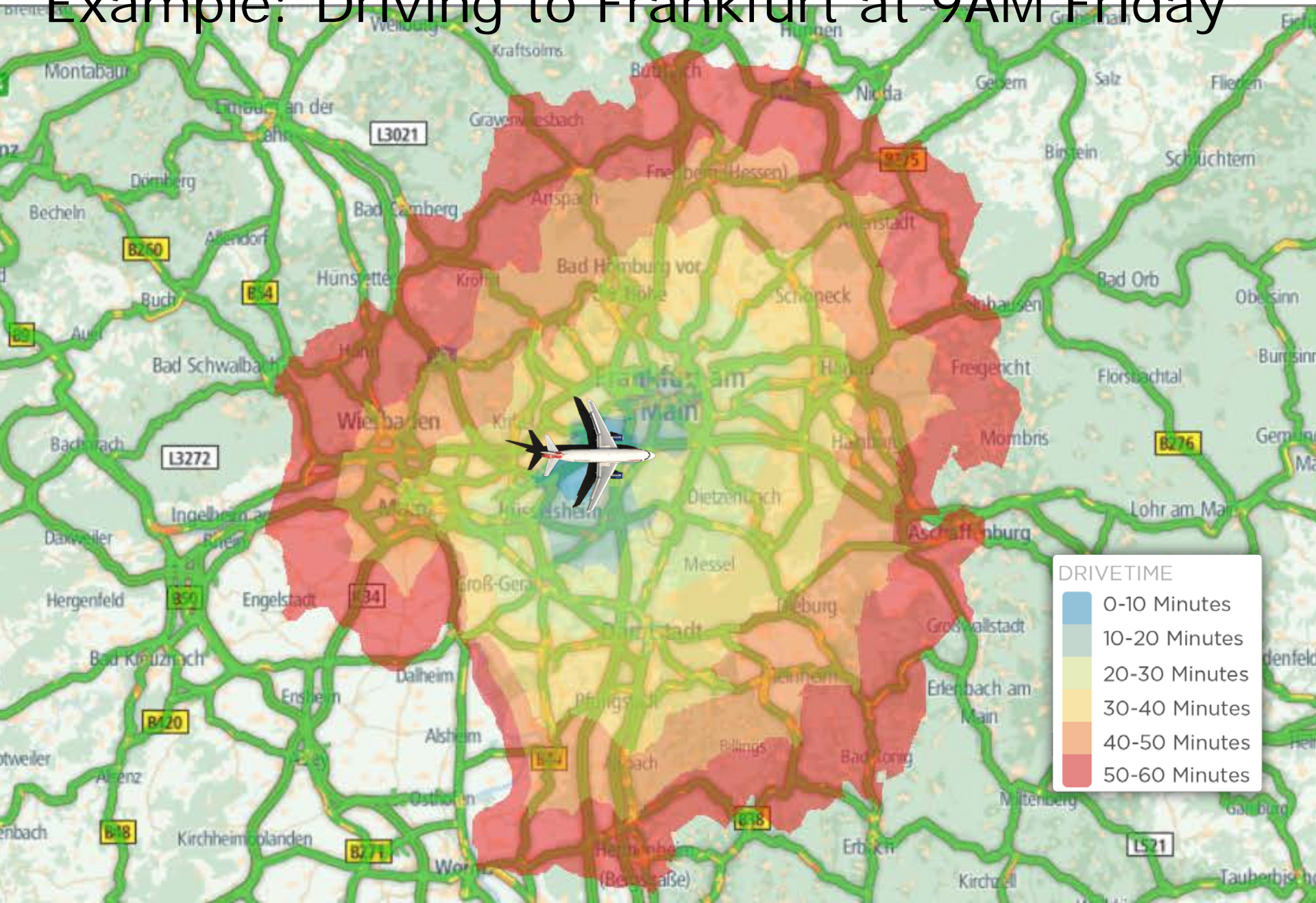


4. TomTom Traffic
3. Speed Profiles
- 2. Map Share**
1. Base maps

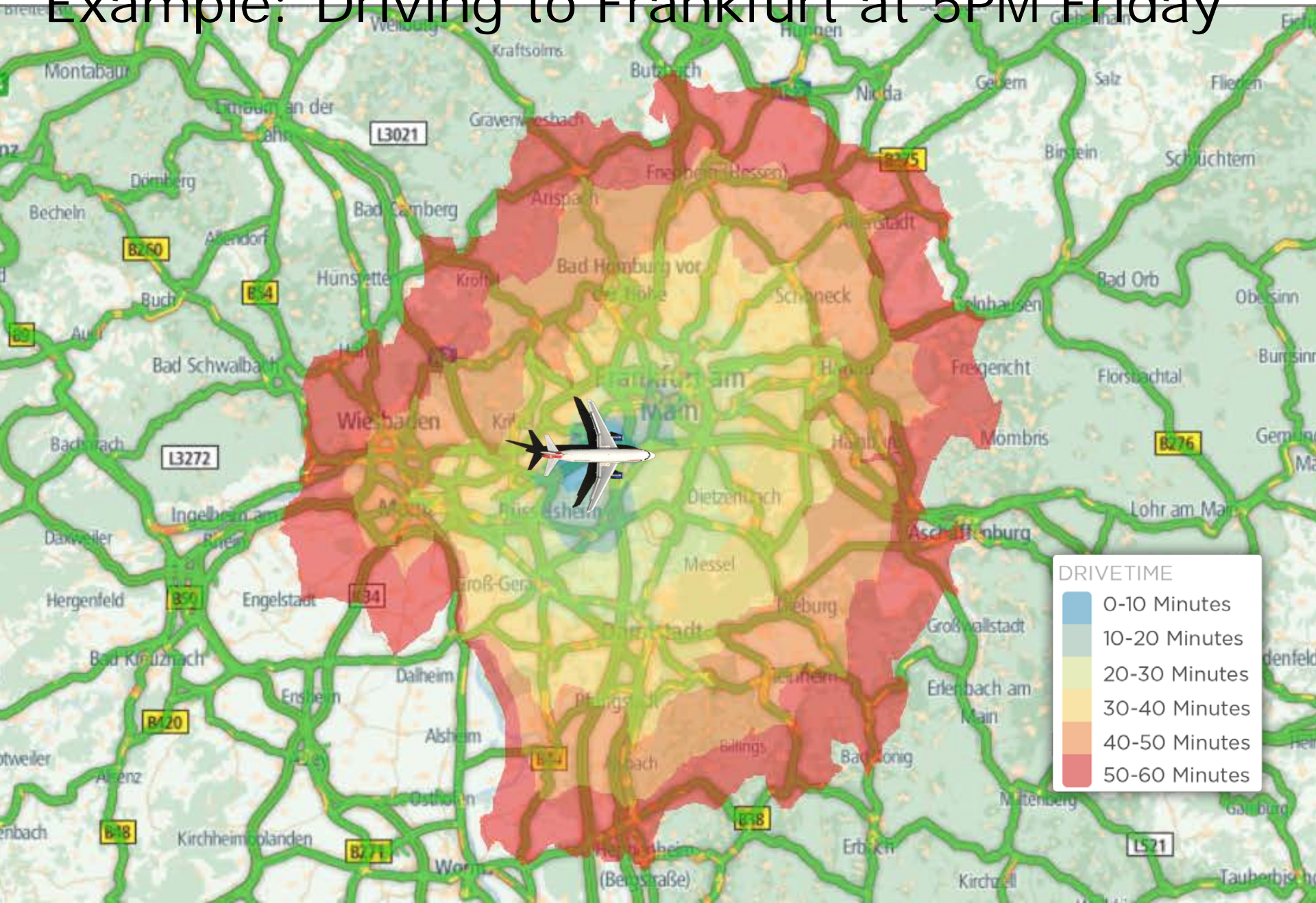


- 4. TomTom Traffic**
3. Speed Profiles
2. Map Share
1. Base maps

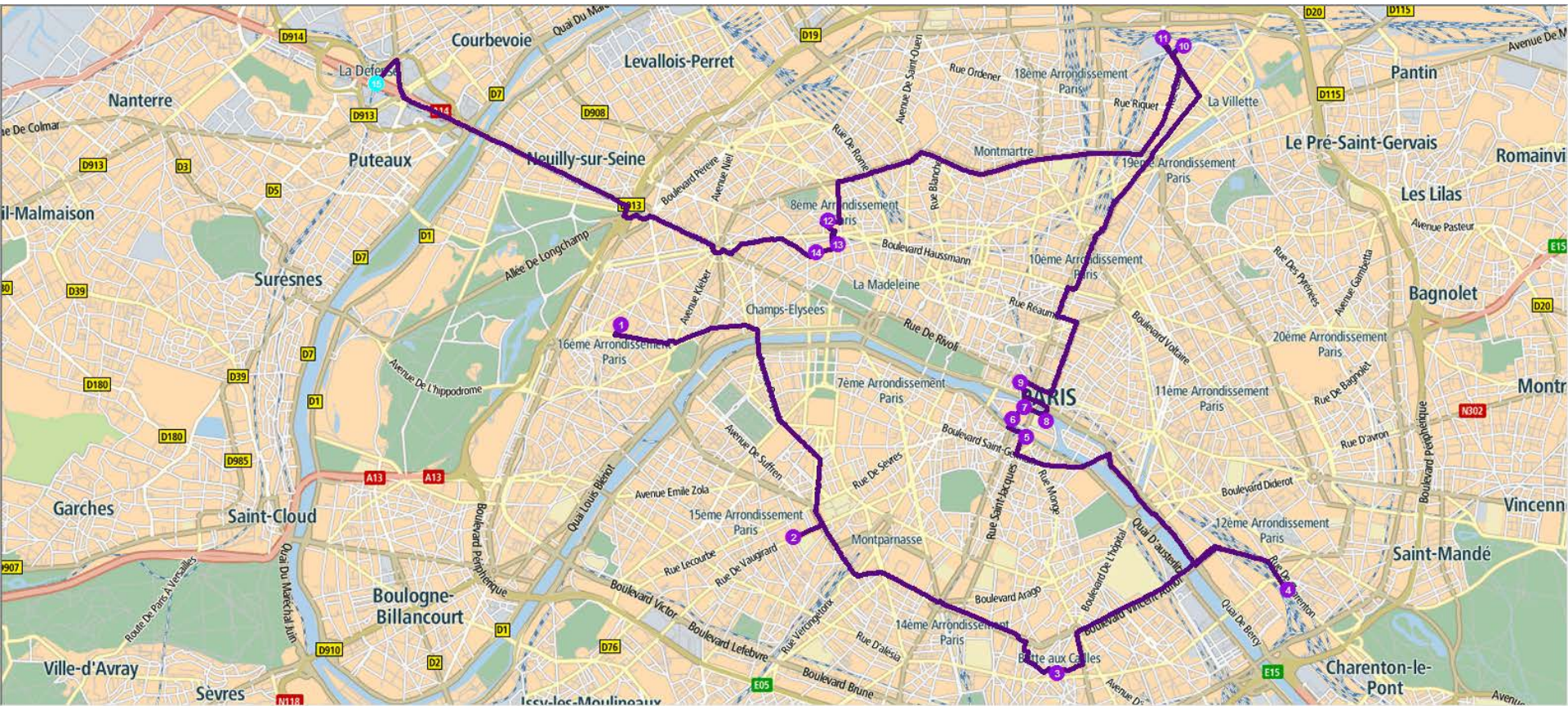
Example: Driving to Frankfurt at 9AM Friday



Example: Driving to Frankfurt at 5PM Friday

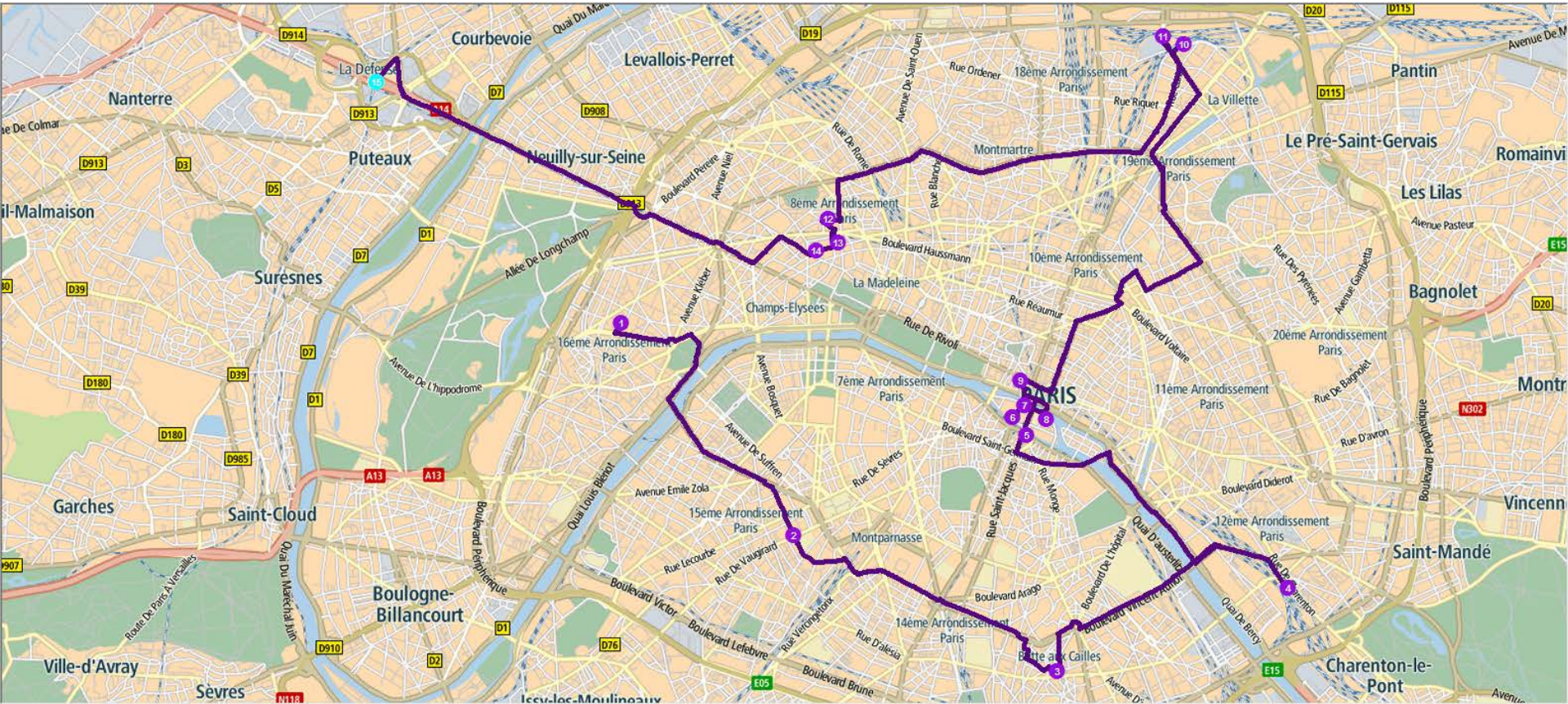


Smart Planning



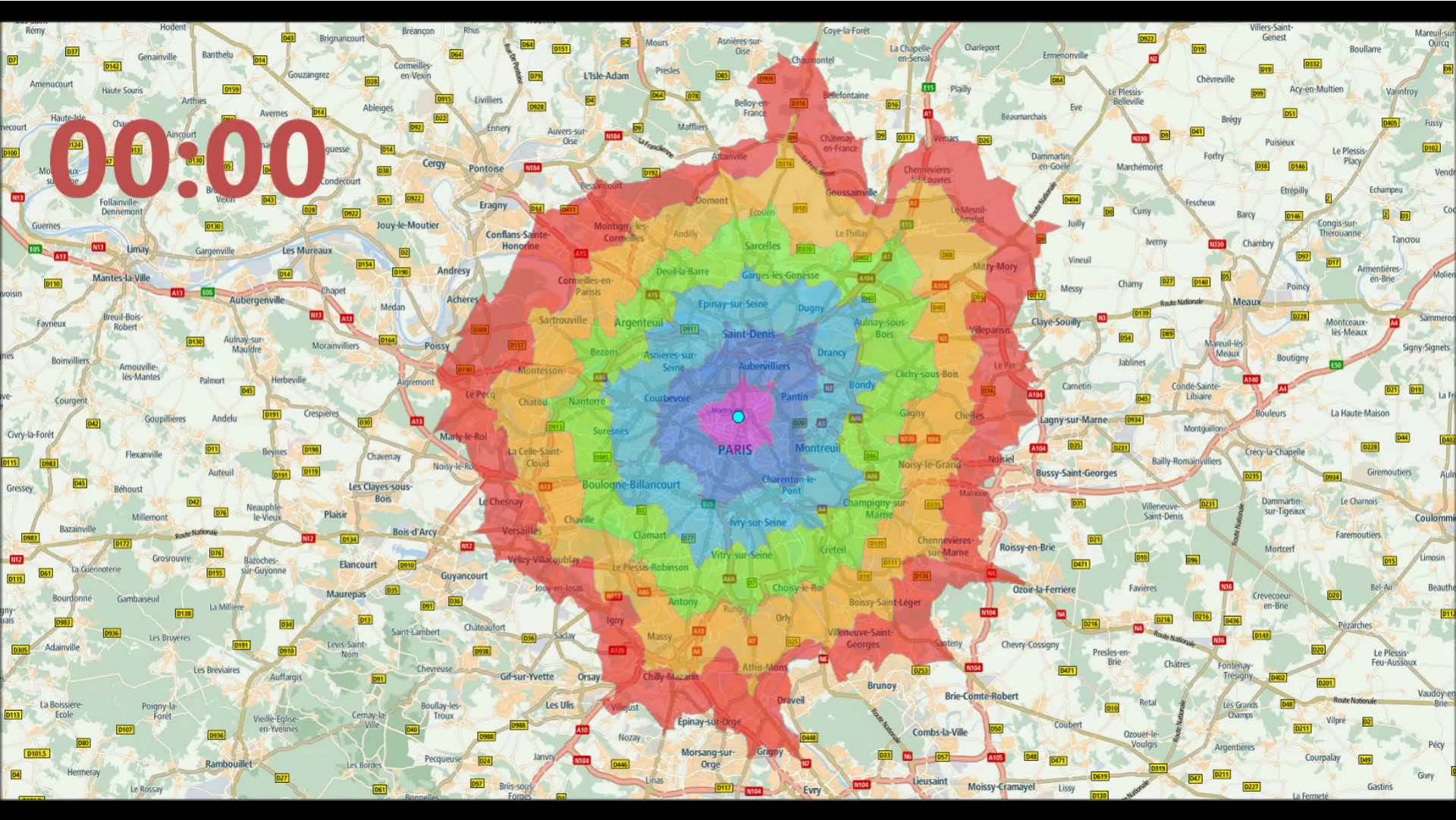
Travel Time: 62 minutes
Distance: 50.0 km

Smart Planning

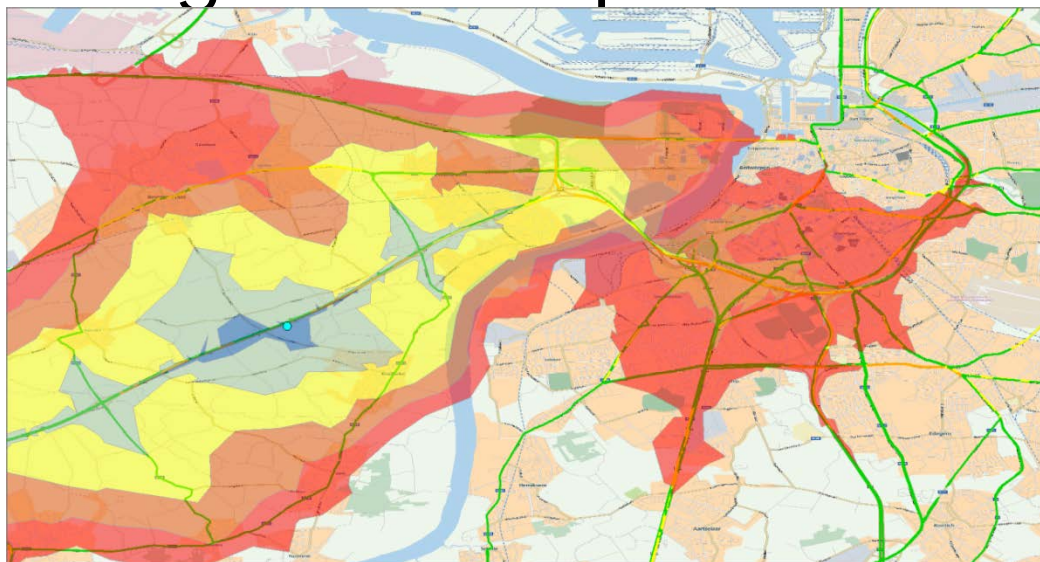


Travel Time: 58 minutes
Distance: 51.1 km

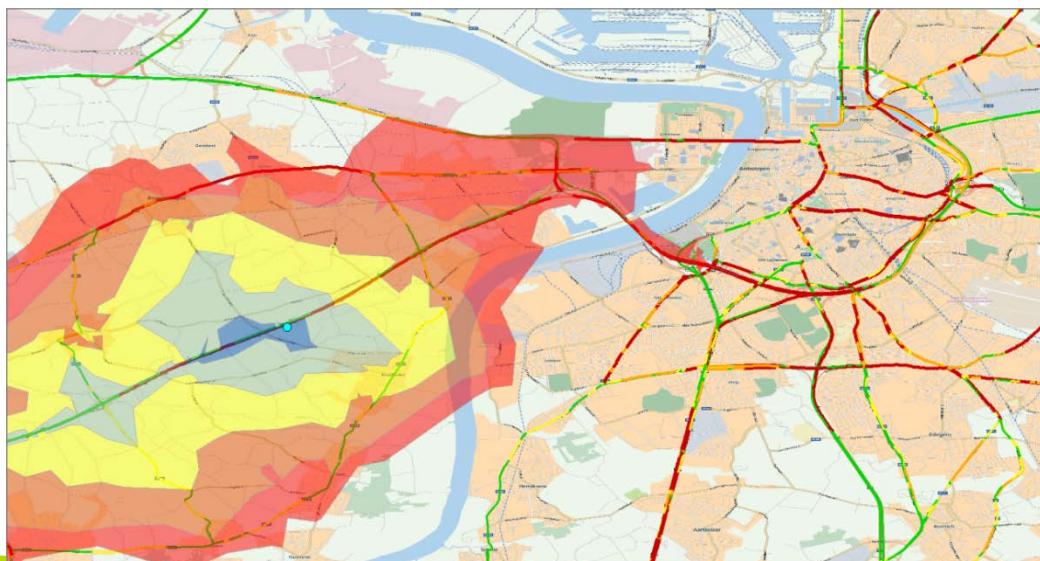
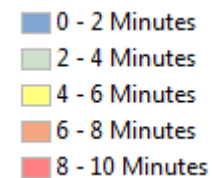
Travel Time Isochrones (Service Areas)



Congestion Impact



Normal accessibility
Area Accessible within 10
minutes of Origin Point



Exceptional accessibility
17:00 on a Friday
Area Accessible within 10
minutes of Origin Point



Questions?