

Toll Plus: Update of iMONITRAF! scenarios 2019

1. Background: Toll Plus as iMONITRAF!'s showcase for common action

Toll Plus is, at the current stage, the central instrument for achieving iMONITRAF!'s main objective of reducing environmental burdens of transalpine transport. With their common resolution (2016), the Alpine regions have presented a detailed approach for harmonization of road pricing systems between and along the Alpine transit corridors and to foster modal shift from road to rail. Especially, the Toll Plus proposal calls for a consideration of the over-proportional external costs related to freight transport in the sensitive Alpine environment, more flexibility in using the mark-up factor as well as a cross-financing approach for revenues. Also, the Alpine regions see the need for a differentiated approach to pricing to consider their specific economic situation in the partially remote Alpine region.¹

Over the last years, iMONITRAF! has lobbied successfully at EU level to ensure that these propositions are reflected in the ongoing revision process of the Eurovignette Directive as relevant legal framework.² In the current work-programme 2019-2020, lobbying and networking activities on Toll Plus remain a major activity for iMONITRAF! to ensure that the voice of the Alpine regions is effectively considered in decision making processes at EU and national level.

2. Update needs: Inclusion of Ventimiglia corridor and new insights on external costs

The resolution on Toll Plus builds on iMONITRAF!'s in-depth study of 2015 which has presented different approaches to implement Toll Plus and which presented scenarios and evaluations. To consider latest developments, the network has decided to update the Toll Plus scenarios for the year 2019. Specifically, the following developments have to be considered in an update on Toll Plus:

- With the new cooperation phase 2019-2020, Région Sud Provinces-Alpes-Côte d'Azur has joined iMONITRAF! as a new partner, extending the relevant perimeter towards the west.
→ All scenarios thus need to be extended to the Ventimiglia corridor.
- In the frame of EUSALP, an update study on external costs in mountain areas has been finished in 2017 – providing new insights on “mountain factors” which are used in the Toll Plus scenarios.
→ These new mountain factors need to be applied in the updated Toll Plus scenarios.³
- In June 2019, the European Commission has presented its update of the handbook of external costs which serves as reference for calculating the Toll Plus scenarios.⁴
→ New insights on external costs need to be considered in the updated Toll Plus scenarios.

¹ iMONITRAF! Resolution on Toll Plus (2016)

² For more information please refer to the iMONITRAF! Annual Report 2018.

³ Please refer to Infrac and Herry Consult (2017) for further information on the update study and for a comparison to the previous results on external costs in mountain areas.

⁴ CE Delft et al. (2019): Update of the Handbook on external costs.

https://ec.europa.eu/transport/themes/sustainable-transport/internalisation-transport-external-costs_en

- In the frame of iMONITRAF!'s monitoring systems, new corridor stretches have been defined for each corridor, representing relevant distances between major transalpine transport hubs.
→ For consistency, the corridor stretches are also applied for the Toll Plus scenarios (however identifying non-mountain stretches were relevant, see below).
- Toll Plus scenarios 2015 only included an illustration for EURO IV HGV, as modernization of vehicle fleet has accelerated, the new scenarios are also calculated for EURO VI HGV.

3. Corridor and scenario definition

Toll Plus scenarios are calculated for transalpine transport relations which link major transport hubs along the Alpine corridors. As in the previous activities, results are presented for the major transport corridors: Brenner for transport between Austria and Italy, Gotthard for transalpine transport in Switzerland and Frejus & Mont Blanc for transport between France and Italy. In addition, Ventimiglia now complements the Alpine corridors and extends the perimeter to the Alpine Arch C in the West.

The following tables gives an overview on the selected corridor stretches and identifies the relevant parts within the mountain area (Alpine Convention perimeter). The “mountain factors” for external costs or the mark-up for mountain regions can, according to the EU framework, only be applied to these mountain stretches of the corridors:

CORRIDOR DEFINITION FOR UPDATED TOLL PLUS SCENARIOS

	Overall stretch (distance between major transalpine hubs)		Of which: mountain stretch as included in the perimeter of the Alpine Convention		Of which: non-mountain stretches at beginning and end of corridor	
	Relation	km	Relation	km	Relation	km
Brenner	Kufstein-Verona	341	Kufstein-Affi	322	Affi-Verona (IT)	19
Gotthard	Basel-Chiasso	300	Rotkreuz-Chiasso	194	Basel-Rotkreuz	106
Mont Blanc	Bellegarde-sur-Valserine - Ivrea	228	Bellegarde-sur-Valserine - Ivrea	228	-	
Fréjus	Lyon-Torino	298	Cessieu - Torino	243	Lyon-Cessieu	55
Ventimiglia	Marseille-Genua	381	Cannes-Savona	180	Marseille-Cannes (FR) Savona - Genua (IT)	201

Table 1

To identify potential impacts of Toll Plus, three stylized scenarios have been developed in the frame of the in-depth analysis 2015. These scenarios are also applied for the update:⁵

- **Scenario 1 – Bottom line:** illustrates the potential effects of fully using today's legal possibilities. Both the Eurovignette Directive, as relevant European framework, as well as the bilateral agreement between Switzerland and the EU, as relevant framework for Switzerland, still have some room for flexibility. Specifically, the bottom-line scenario

⁵ For a detailed description of the scenarios, please refer to chapter 3.3. of the in-depth study 2015.

assumes 1) the full use of the 25% mark-up on the mountain parts of the corridors for EU countries and 2) the application of the maximum allowed LSV charge of 325 CHF for Switzerland according to the bilateral treaty CH-EU.

- **Scenario 2 – Internalisation fee:** starts from the internalisation rationale and is linked to short-term environmental targets of the iMONITRAF! strategy. In its minimum application, it applies external cost factors (including appropriate mountain factors) for air and noise emissions, in the maximum approach it is extended to all external cost elements including appropriate mountain factors (climate, nature and landscape, accidents). This maximum scenario needs to be seen as high-end scenario if the scientific state-of-the-art on external costs is fully implemented.
- **Scenario 3 – Extended mark-up for rail-financing:** starts from financing rationale and extends the mark-up to 50% on the mountain parts of the corridors (EU countries, however not on tunnel charges). For Switzerland, it is assumed that a share of the current subsidies for CT is cross-financed via a cross-financing levy.

4. Toll Plus scenario results 2019

The scenarios are applied to the new corridor stretches (see table 1), using the updated external cost factors (CE Delft et al. 2019) and updated information on mountain factors (Infras & Herry Consult 2017). All results are illustrated for EURO IV as well as EURO VI HGV with 5 axles, indicating both the new resulting rate as well as the difference (Δ) to the existing rate/status quo in 2019. Detailed results per corridor with information on absolute toll costs (€/trip) are illustrated in Annex I.

As comparison, the average proposed toll rate of the ALBATRAS study (Suivi de Zurich) is shown. It can be seen that the proposed unitary rate of ALBATRAS with 29 €/ct/km on all corridors lies rather at the upper end of our proposed scenarios. Only scenario 2 maximum leads to a higher average value, all other scenarios lie well below.

SPECIFIC TOLL RATES (€/CT/KM) PER CORRIDOR - RESULTS OF SCENARIO CALCULATIONS (EURO IV)

EURO IV		Brenner value	Gotthard value	Mont Blanc value	Fréjus value	Ventimiglia value	Average value
Status quo 2019	<i>existing rate</i>	41,5	102,5	189,2	153,3	33,2	
Scenario 1 - Bottom-line	<i>Rate in scenario "bottom-line"</i>	44,9	115,8	200,4	162,8	38,2	
	additional toll "bottom-line" compared to 2019	3,4	13,3	11,3	9,4	4,9	9,3
Scenario 2 - Internalisation fee minimum	<i>Rate in scenario "internalisation fee" minimum</i>	54,3	115,8	202,6	165,0	41,2	
	Δ rate with scenario "internalisation fee" min	12,8	13,3	13,4	11,6	8,0	13,2
Scenario 2 - Internalisation fee maximum	<i>Rate in scenario "internalisation fee" maximum</i>	78,4	130,5	227,1	187,9	61,0	
	Δ rate with scenario "internalisation fee" max	36,9	28,0	37,9	34,6	27,8	34,3
Scenario 3 - Extended mark-up for rail financing	<i>Rate in scenario "extended mark-up"</i>	53,7	135,8	211,7	172,2	43,1	
	Δ rate with scenario "extension of mark-up"	12,2	33,3	22,5	18,9	9,9	22,7
Comparison ALBATRAS	Δ average rate in ALBATRAS study						29,0

Table 2 Scenario rates (in €/ct/km) for EURO IV trucks (40t 5 axles)

SPECIFIC TOLL RATES (€CT/KM) PER CORRIDOR - RESULTS OF SCENARIO CALCULATIONS (EURO VI)

EURO VI		Brenner value	Gotthard value	Mont Blanc value	Fréjus value	Ventimiglia value	Average value
Status quo 2019	<i>existing rate</i>	41,0	86,9	189,2	153,3	33,2	
Scenario 1 - Bottom-line	<i>Rate in scenario "bottom-line"</i>	44,4	100,2	200,4	162,8	38,2	
	additional toll "bottom-line" compared to 2019	3,4	13,3	11,3	9,4	4,9	8,5
Scenario 2 - Internalisation fee minimum	<i>Rate in scenario "internalisation fee" minimum</i>	45,8	100,2	194,2	157,7	36,2	
	Δ rate with scenario "internalisation fee" min	4,8	13,3	5,0	4,4	3,0	7,7
Scenario 2 - Internalisation fee maximum	<i>Rate in scenario "internalisation fee" maximum</i>	69,8	113,4	218,7	180,7	56,0	
	Δ rate with scenario "internalisation fee" max	28,8	26,6	29,5	27,3	22,8	28,3
Scenario 3 - Extended mark-up for rail financing	<i>Rate in scenario "extended mark-up"</i>	53,1	120,2	211,7	172,2	43,1	
	Δ rate with scenario "extension of mark-up"	12,1	33,3	22,5	18,9	9,9	22,6
Comparison ALBATRAS	Δ average rate in ALBATRAS study						29,0

Table3 Scenario rates (in €ct/km) for EURO VI trucks (40t 5 axles)

In general, the updated scenario calculations re-confirm the results of the 2015 study:

- All Toll Plus scenarios have a considerable impact on toll prices (rates per km). The application of the 25% mark-up (scenario 1) or the external cost charge for air quality and noise (scenario 2 minimum) lead to smaller impacts with toll rates rising, on average, between 9 and 13 €ct/km for EURO IV and around 8 €ct/km for EURO VI. Scenario 3 with the maximum approach leads to considerable impacts with toll rates that are even higher than in an application of the 50% mark-up.
- For EURO VI, impacts are considerably lower than for EURO IV, especially in scenario 2 which differentiates the external cost factors for EURO IV and EURO VI. In scenarios 1 and 3, the impacts on the French-Italian corridors are identical, as the mark-up builds on the existing rates which are not differentiated on the French and Italian motorways.
- Compared to the Toll Plus scenarios 2015, impacts of scenarios 1 and 3 are slightly higher as existing toll rates have increased over the last four years. For scenario 2 (min and max), the additional toll rate with application of the external cost charge for air quality and noise is slightly lower. This is due to the adjusted mountain factors as represented in the update study (Infras & Herry Consult 2017) which propose slightly lower mountain factors for air quality and noise (factor 4 instead of factor 5).
- For Ventimiglia, the picture is similar as for the corridors Mont Blanc and Fréjus when looking on effects of the Toll Plus scenarios. But due to much higher traffic volumes on Ventimiglia, Toll Plus offers a considerable potential for raising additional revenue (see table 4 below).

Toll Plus has the main objective to set financial incentives for modal shift and to improve internalisation, but it also generates additional revenue. According to the proposal of the iMONITRAF! resolution on Toll Plus, this revenue should mainly be used for financing of additional rail infrastructures in the Alpine region. The following table gives an overview on potential additional revenue which could be generated via Toll Plus (assuming a 50:50% share of EURO IV and VI on all corridors).

POTENTIAL REVENUE GENERATED THROUGH TOLL PLUS (IN MIO. €)

(share 50:50 EURO IV and VI)	Brenner corridor	Gotthard corridor	Mont Blanc corridor	Fréjus corridor	Ventimiglia corridor
HGV volume 2017	2.449.880	862.495	637.655	765.040	2.062.615
Corridor length (km)	335	300	230,9	298	381
Annual additional revenue (Mio. €)					
scenario "bottom-line"	28	34	17	22	11
scenario "internalisation fee" min	72	34	14	18	12
scenario "internalisation fee" max	270	71	50	71	58
scenario "extension of mark-up"	100	86	33	43	23
Optimised scenario as used in DPSIR (20 €/ct/km on Gotthard, Mont Blanc, Fréjus, Ventimiglia) (25 €/ct/km on Brenner)	205	52	29	46	46

Table 4 * Numbers represent additional revenues generated through Toll Plus. Please note: Traffic flows along the Ventimiglia corridor are calculated according to the Italian classification system, so HGV traffic volumes might be overestimated.⁶

5. Outlook

The updated scenarios reconfirm the potential of Toll Plus to considerably influence the competitiveness between road and rail and to set incentives for modal shift. Especially, a consideration of additional external costs or a higher mark-up on mountain motorways can influence toll rates in a meaningful way. Both elements are included in the current version of the revised Eurovignette Directive as agreed by the European Parliament in October 2018. The iMONITRAF! network will remain actively involved in ensuring that the revised Directive will offer more flexibility in this respect to improve internalisation of external costs and to generate additional revenue for cross-financing.

Concerning the scenario development, the differentiation between EURO IV and EURO VI provides some insights on the effects of technological change on toll levels and revenue generation. It would be interesting to include a scenario for alternative vehicles to provide insights on potential toll rates for those vehicles to avoid ambivalent effects for modal shift. Such a scenario will be developed as input for the political discussion 2020 (either in form of the DPSIR approach or as a specific scenario factsheet).

⁶ In the frame of the iMONITRAF! monitoring system, vehicles along Italian-French corridors are counted according to the system used by the Italian highways societies: heavy-vehicle category include those passenger vehicles belonging to class B (height above 1.3 m) and classes 3,4,5 (according to the number of axles) (see iMONITRAF! Annual report 2018).

Further reading on Toll Plus

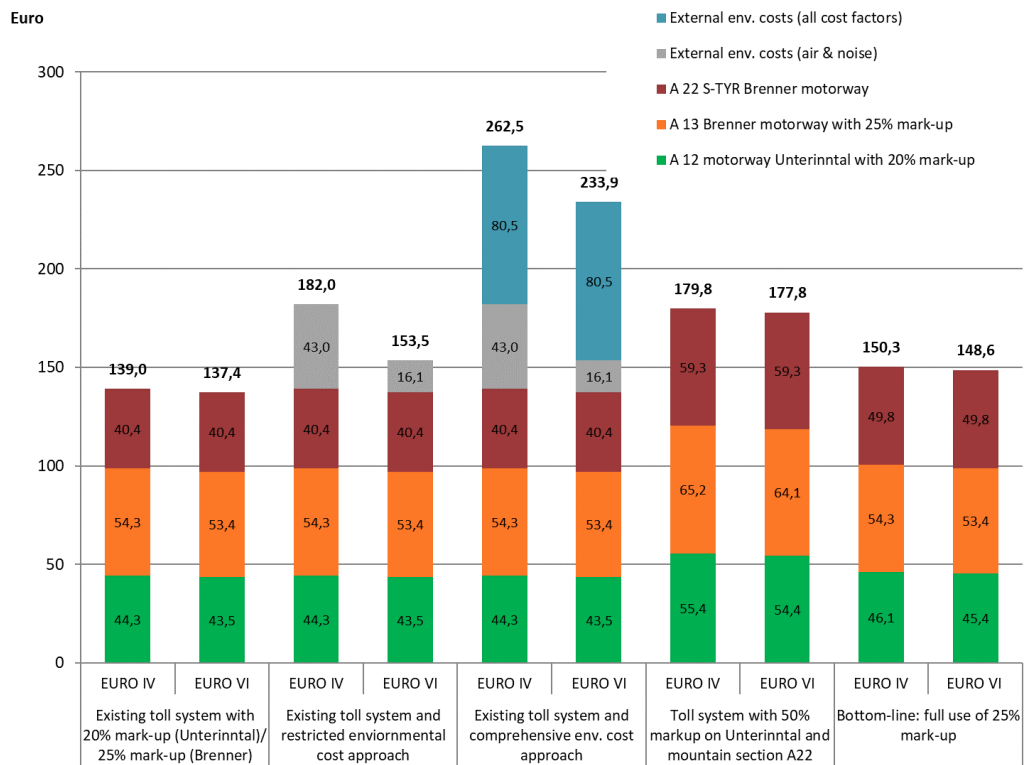
iMONITRAF! network (2015): [Specifying the regional proposal on Toll Plus](#) – An in-depth analysis of the iMONITRAF! network on design elements, impacts and legal issues.

[iMONITRAF! resolution on Toll Plus \(2016\)](#): Specifying the common strategy.

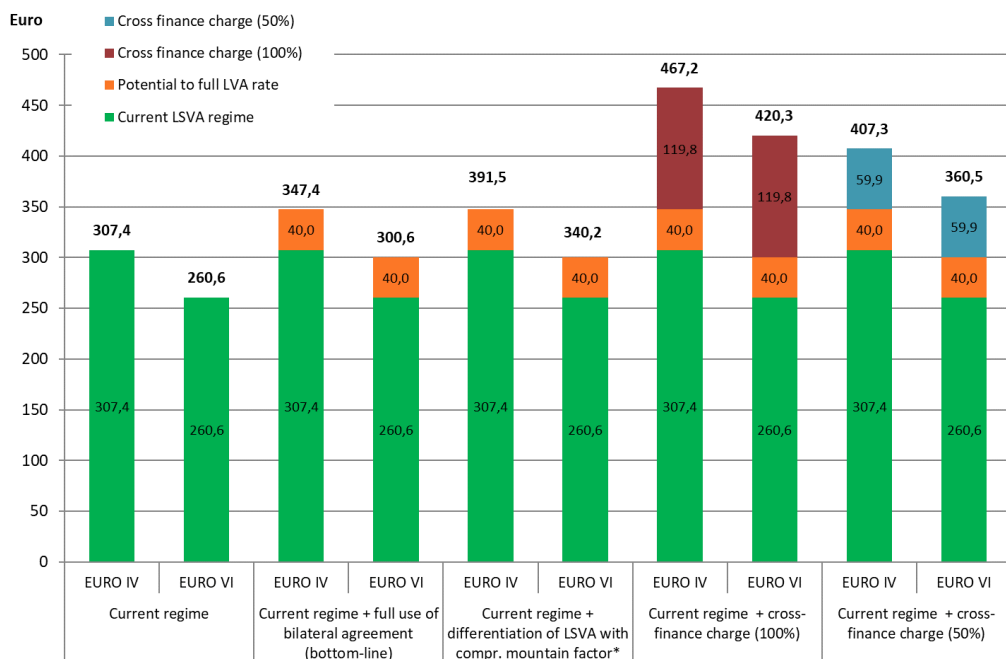
[Fact Sheet Toll Plus \(2017\)](#): A harmonized pricing framework for the Alps: a proposal on Toll Plus

Annex: Detailed Toll Plus scenarios for each corridor (2019) – Costs per trip

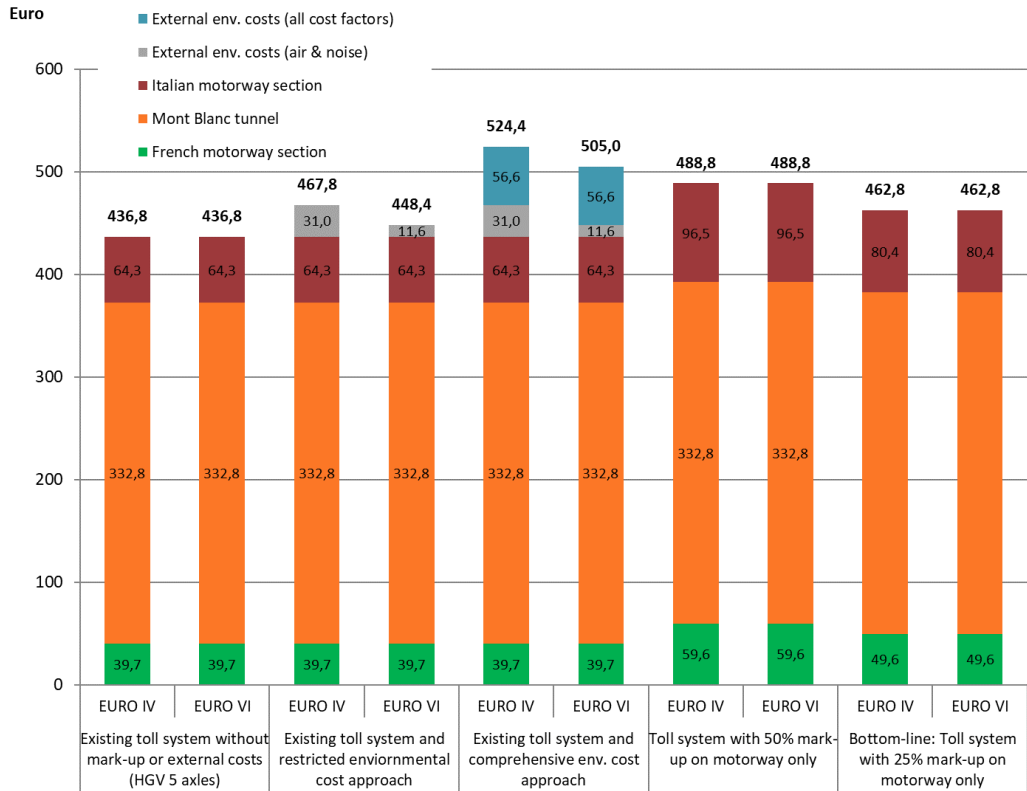
TOLL PLUS SCENARIOS BRENNER CORRIDOR 2019



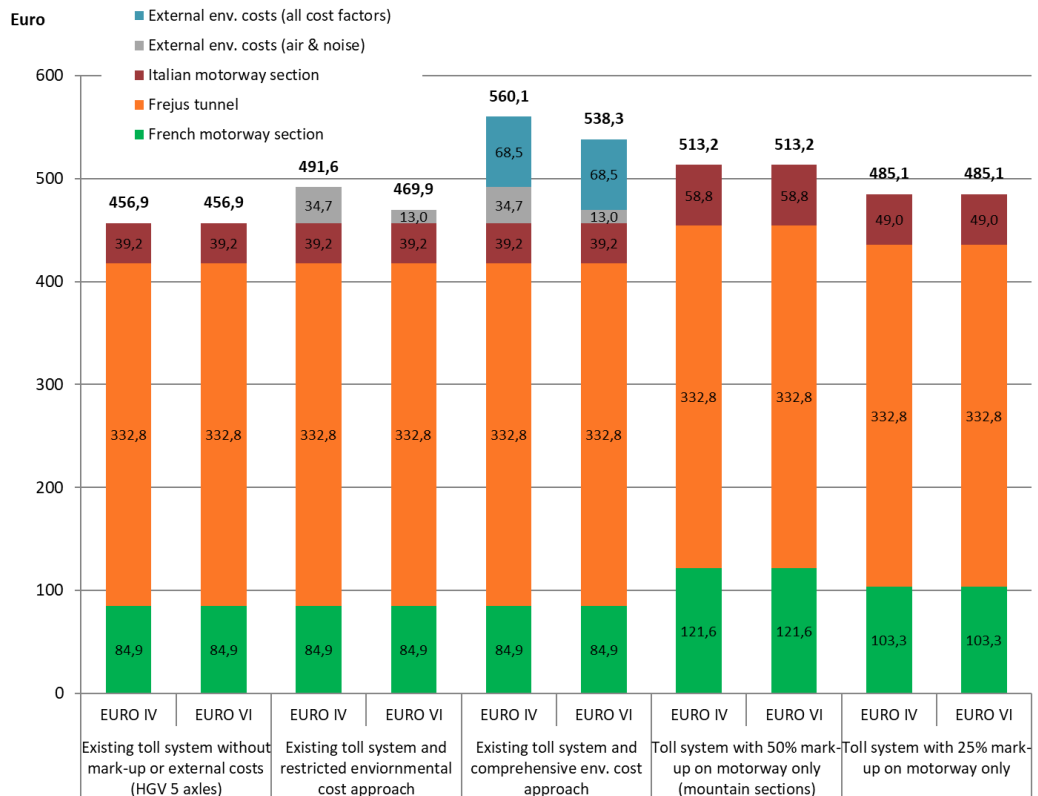
TOLL PLUS SCENARIOS GOTTHARD CORRIDOR 2019



TOLL PLUS SCENARIOS MONT BLANC CORRIDOR 2019



TOLL PLUS SCENARIOS FRÉJUS CORRIDOR 2019



TOLL PLUS SCENARIOS VENTIMIGLIA CORRIDOR 2019

