Technical Study on Smart Borders – Cost Analysis

Final Report

Written by PwC
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Directorate-General for Home Affairs
Directorate C— Schengen
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Executive Summary

Following the February 2014 meeting with Member States, the decision was taken to launch a new Technical Study to explore and assess various options for the Smart Borders (SB) Package and prepare a revised cost analysis.

The main objective was to provide up-to-date, reliable cost estimates of the EES and RTP systems to be borne at the European Commission (central) and Member State (national) level.

The second objective was to assess whether the budget allocated for the SB project package in the Multi Financial Framework (MFF) 2014-2020 (€791 m)[1] would cover the estimated costs.

In addition, other objectives included:

- To estimate the costs of a common development of one single EES/RTP system compared to the development of EES and RTP systems separately;
- To assess the financial impact on the cost estimates when building those systems reusing elements of the existing VIS;
- To explain the main changes compared to the previous calculations in the 2013 Impact Assessment;
- To provide the main differences in cost items between Target Operating Models (TOM) A, B, C; M and N;
- To estimate the costs of the Pilot;
- To offer the Member States a practical toolbox that makes it possible to identify national expenditures;
- To enable better analysis of the options discussed within the Technical Study for which cost was identified as an important assessment criterion.

Starting point for the cost estimation

A cautious approach has been used throughout the report regarding cost estimation. This approach is aimed at avoiding underestimation of the final costs. The assumptions used for this cost assessment are the following:

1. **Financial timeline:** EES and RTP development period is expected to last three years, starting in 2017 and ending in 2019. Both systems are expected to become operational in 2020.

2. **Benchmark with existing systems:** The VIS and the SIS II can provide benchmark data when relevant, as they operate in a comparable environment to that of the future EES and RTP.

3. **National Uniform Interface (NUI):** The assumption is that a NUI will be developed to provide the interface between the Member States (MS) and the Central System. The introduction of the NUI concept is the main architectural change that causes deviation from the original MFF budget allocation. The NUI enables Member States to connect to the Central System without having to develop and deploy their own infrastructure, reducing the complexity and the costs of the project. An envelope of €4 m is provisioned for each MS to cover the integration effort from their existing infrastructure to the central system. This option reduces the costs to be borne on Member States' side (see section 7.2), as the development costs of the NUI are shifted to the central side.

4. **SOA-based BMS:** the assumption is that a new SOA-based BMS serving the needs of VIS, EES and RTP will be developed. BMS costs are therefore the same regardless of the scenario (EES and RTP developed separately or jointly). In the case of EES and RTP developed separately the cost of the BMS is distributed in equal parts on the two systems.

5. **Number of Member States:** 30 countries.

6. **Central Unit / Backup Central Unit (CU/BCU) configuration:** the setup between two nodes is considered to be active/passive.

[1] The original budget allocation of €1.3 billion which covered the period 2014-2021 was reduced to €1.1 billion to be aligned with the duration of the multi-annual financial framework (2014-2020).This financial package was then reduced to €791 million during the MFF negotiations concluded in 2013.

7. **TOM (Target Operating Models) baseline:** TOM C for EES and TOM M for RTP, those TOMs being those that are the closest from the existing legal proposals and the most expensive *(for more information about TOMs, please refer to chapter 3)*.

8. **Data retention baseline:** The data retention option that is the closest to the legal proposal is used, i.e. 181 days for EES and 5 years for RTP.

9. **Implementation:** EES and RTP implementation would happen simultaneously.

Main results

Table 1 summarises the cost estimations presented in this report based on the baseline of TOM C and M. It appears **that the initial MFF budget allocation 2014-2020 (€791 m) can be considered sufficient to cover the new cost estimation for the MFF period 2014-2020**, i.e. three years of development from 2017 to 2019 and one year of operations. The total cost for four years would be €381 m for EES and RTP if developed jointly and €430 m if developed separately.

The other main findings are the following (see Table 1):

1. **€49 m** of total savings over 4 years can be realised if EES and RTP are built as a single system (for more details, please refer to Table 66).

2. At least **four additional years of operations** (i.e. 2021-2023) could be covered by the €791 m budget. [2]

3. Integrating the EES and RTP with the VIS from the beginning of the development would entail an additional cost of **€39 m.**

4. A progressive approach of integration of EES and RTP with the VIS (reusing VIS artefacts to build EES and RTP) would lead to a saving of **€4.5 m on contractor development.**

Table 1: *Comparison between separate systems and jointly developed EES and RTP for the period 2017-2020 and for the period 2017-2023*

		EES and RTP: separate systems				EES and RTP: single system				
	BMS: € 34.5 m NUI: € 3.8 m	EES		RTP		EES / RTP		*Saving compared to separate systems*	*Integrated with VIS*	*Progressive approach*
2017-2020: 3 y dev. + 1 y op.	CENTRAL (total)	€94.81 m	42%	€73.24 m	36%	€130.55 m	34%	€37.5 m	€133.45 m	€126.03 m
	Central IT system									
	Contractor development	€12.98 m	6%	€9.97 m	5%	€16.18 m	4%	€6.77 m	€19.82 m	€11.66 m
	Hardware	€10.14 m	4%	€9.18 m	4%	€17.72 m	5%	€1.61 m	€16.83 m	€17.72 m
	Software	€39.32 m	17%	€24.63 m	12%	€52.2 m	14%	€11.75 m	€49.59 m	€52.2 m
	Administration	€14.94 m	7%	€15.06 m	7%	€22.57 m	6%	€7.43 m	€25.62 m	€22.57 m
	Network	€13.75 m	6%	€10.97 m	5%	€15.21 m	4%	€9.51 m	€13.28 m	€15.21 m
	Training and meetings	€3.19 m	1%	€3.07 m	1%	€6. m	2%	€.25 m	€7.63 m	€6. m
	Office space	€.49 m	0%	€.37 m	0%	€.68 m	0%	€.18 m	€.68 m	€.68 m
	NATIONAL (total)	€131.19 m	58%	€131.19 m	64%	€250.5 m	66%	€11.88 m	€286.54 m	€250.5 m
	Contractor development	€60. m	27%	€60. m	29%	€120. m	31%	€. m	€156. m	€120. m
	Administration	€71.19 m	32%	€71.19 m	35%	€130.5 m	34%	€11.88 m	€130.54 m	€130.5 m
	CENTRAL + NATIONAL TOTAL	€226. m	100%	€204.43 m	100%	€381.05 m	100%	€49.38 m	€419.99 m	€376.53 m
		€430.43 m								
2017-2023: 3 y dev. + 4 y op.	CENTRAL + NATIONAL TOTAL	€326.93 m		€295.39 m		€553.08 m		€69.24 m		
		€622.32 m								

[2] This is theoretical since it will not be possible in practice to commit actions that will take place more than two years after the end of the MFF (i.e. 2022).

Cost differences between TOMs

TOMs C and M were taken as the baseline for the calculation of costs. The main cost items impacted by the choice of TOMs are (i) network, (ii) hardware and (iii) software.

Overall, the cost difference between TOMs is limited (less than 1% between TOM C and B and around 5% between TOM C and A). Concerning the EES, the main conclusion is that TOM A is always the cheapest alternative (approximately -5%) regardless of the scenario. Regarding the RTP, TOM N does not have a significant impact on the cost to be borne at the central level but it could impact national budgets.

The introduction of facial image in all the TOMs, which had not been estimated for the original budget allocation, **increases the overall cost of approximately €6 m for the 2017-2020 period**, as it induces the purchase of an additional licence for the BMS.

Main deviations from the MFF budget allocation (2014-2020)

The table below describes the main deviations compared to the initial MFF 2014-2020 budget allocation, more details are provided in section 7.1.3.

Cost reduction	Cost increase
• Difference in the financial timeline, as the Smart Borders proposal will take later than initially foreseen and therefore three years of development and one year of operation are considered; • Suggested use of the e-MRTD as a single token, representing a total saving of €15 m compared to the previous ad-hoc token solution; • Suggested joint development and maintenance of EES and RTP impacting costs positively; • Shift of the MS infrastructure costs to the central level as result of the introduction of the NUI, which would be developed and deployed centrally, and which reduces the complexity of the systems at Member States' side, which applies on 30 countries and allows savings of resources for maintaining and operating the systems; • Exclusion of the financing of the costs related to the hosting of the Infrastructure in Member States, on the assumption that the systems will be installed in existing premises in Member States and that the EU budget would not be used to support construction or rental of IT premises. • Reduction of initial investment which has an impact on operational costs; • Lowered network costs due to prices offered by the new contractor; • Reduction of administration costs because of lower number of FTEs identified for monitoring the systems at national side.	• Increased number of Member States (30) considered; • Higher software costs than what was in the MFF provisions; • Increased number of training courses and meetings. • Facial image as biometric identifier in combination with FPs. The addition of the software for supporting the facial image in the BMS would increase its cost up to 20-25%.

<u>Other cost options</u>

The Cost analysis also looks into costs linked to various additional options (not included in the baseline) such as:

1. Law enforcement access (LEA): the decision to enable the LEA for the EES and RTP would increase implementation costs due to additional functionalities and transactions. The impact on **the initial**

investment would be of approximately €2.5 m spread over 3 years and distributed mainly across hardware, software and the BMS. **Maintenance costs** are estimated to approximately amount to an **additional €200,000** per year.

2. Active-active setup: Given the lack of technical and functional specifications, the report concludes that further study would be needed to estimate the cost difference with the current - active-passive – setup.

3. Data retention: while a data retention period of 181 days for the EES and up to five years for the RTP is used as a baseline for the analysis, alternative retention periods of one year and five years for the EES are considered. **The cost increase can reach up to €69.6 m for the 5 years data retention for the joint EES and RTP.** This increase can be explained by a bigger database required, more processing power and higher BMS software license costs among others.

4. Information to travellers and carriers: one option considered in the Study, is the possibility for travellers to consult their personal data from a Self-Web-service. Carriers could use the same channel to verify the validity of users' visa. The cost impact of the Self-Web-Service has been **estimated to an initial investment of €4.2 m for the development phase and €1.5 m per year of operational costs** on average.

5. RTP online enrolment: this option would enable travellers wishing to enrol in RTP, to do so via a dedicated online enrolment website. This **possibility would entail an initial investment of €1.2 m followed by average operational costs of €360,000 per year.**

6. EES and RTP integrated with VIS: the possibility to integrate the EES and RTP with the VIS is in line with an integrated process approach. In terms of costs, calculations showed that overall it is a **more costly solution (€39 m, +10% of the total cost over four years)** than the option of building the EES and RTP as a greenfield project.

7. Re-using VIS artefacts for the EES and RTP: the report concludes that **this progressive approach has a positive cost impact (-€4.5 m, - 1% of the total cost over four years)** in terms of contractor development. Further synergies would be achieved only after the full integration with the VIS which would require further investments.

In addition the combination of TOMs selected as baseline introduced the use of the Facial Image and of the systematic identification (1:N) for the TCNVE. The below table summarise the impact on the cost for each variation and option and whether the variant/option was part of the baseline.

Table 2: *Summary of the cost options (included or excluded from the baseline)*

Variants and options not part of the baseline	*In million*	*Included in the baseline*
LEA		
Development	€2.5	✘
Yearly maintenance	€0.2	
Active- active setup	Not available	✘
Data retention		
1 year (until 2023)	€39	✘
5 years (until 2023)	€69.6	
Information to travellers and carriers		
Development	€4.2	✘
Yearly maintenance	€1.5	
RTP online enrolment		
Development	€1.2	✓
Yearly maintenance	€0.36	
EES and RTP integrated with VIS	€39	✘
Re-using VIS artefacts for the EES and RTP	- €4.5	✘
Facial image		
Development	€5.7	✓
Yearly maintenance	€0.5	
1:n identification		
Development	€4.5	✓
Yearly maintenance	€0.9	

Options for the Pilot

The objective of the Pilot, to be carried out in 2015, is to test significant parts or components of the solution and conclude on the results. Costs related to the Pilot are heavily dependent on (i) specifications of the Pilot, (ii) sample size for test items and (iii) inclusion or exclusion of AFIS vendors (buy vs borrow equipment).

For the execution phase, costs in terms of equipment and integration have been estimated to amount to approximately €500,000. Other costs, estimated to amount to approximately €2.3 m, such as meeting, travelling and contractor costs, must be taken into account as well. **The evaluation of the costs for the Pilot concludes that the proposed set of pilot options fits within the €3 m budget.**

MS toolbox

A MS toolbox was created to allow each MS to estimate the expenses that they will have to face, by presenting a list of identified cost components on the national side, and where possible some pricing indications. It includes three main categories of costs: border equipment, human resources, national infrastructure and network. It will be provided to MS once the final specifications of the Smart Borders systems and processes are available.