EUROPEAN UNION AGENCY FOR RAILWAYS

Making the railway system
work better for society.

Full Impact Assessment

Inventory of assets – Assessment of accessibility characteristics and data collection

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Document History

Version	*Date*	*Comments*
0.1	14/02/2017	Text from the qualitative assessment performed in 2016, transferred in the Full Impact Assessment form
0.2	20/02/2017	Quantitative analysis
0.3	24/02/2017	Review after comments from IOP
0.4	22/05/2017	Review after comments from CER-EIM

Contents

1. Context and problem definition

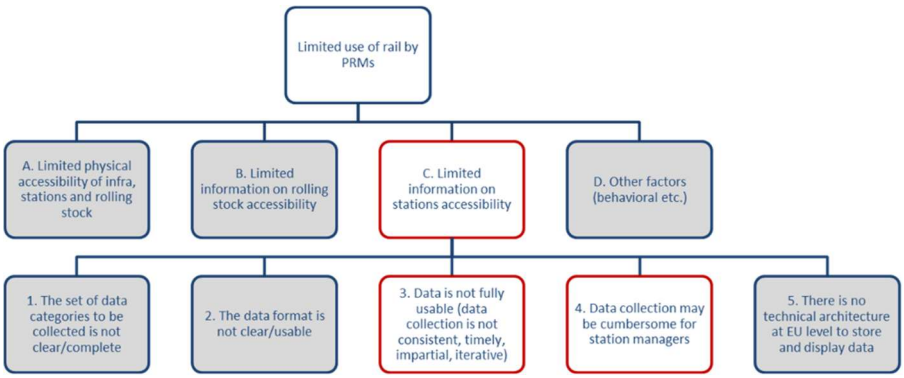
1.1. Problem and problem drivers

One of the acknowledged drivers for the limited use of rail by the persons with reduced mobility is represented by the **limited information on accessibility characteristics for stations** (*second layer in the problem tree below*). According to the 2013 Flash Eurobarometer "Europeans' satisfaction with rail services", this is perceived as equally important to accessibility itself (http://ec.europa.eu/commfrontoffice/publicopinion/flash/fl_382a_en.pdf)

The limited information on accessibility characteristics for stations is, in its turn, conditioned by issues (*third layer in the problem tree below*) related to:

- the data parameters being collected (factor 1, third layer in the problem tree below)
- the data format (factor 2)
- the limited consistency, timeliness, impartiality and continuity of data collection (factor 3)
- the efforts required for the station managers (factor 4)
- the lack of a EU architecture to store and display the data (factor 5).

To address this, the European Union Agency for Railways (hereinafter called "the Agency") was requested by the PRM TSI in force "to set up and run a working party in charge of making a proposal for a **recommendation** for the Inventory of Assets (IoA) (…) including on content, data format, functional and technical architecture, operating mode, rules for data input and consultation, rules for self-assessment and designation of the entities responsible for data provision (…)"



The following factors (greyed out boxes) are not in the scope of the current Impact Assessment (IA):

- **Data content** was addressed by the working party and a comprising static inventory of station characteristics was produced and agreed upon, including by PRM associations.
- **Data format** was defined as narrative, with pre-defined categories, and interoperable, easily usable for the purpose of the IoA and permitting more sophisticated applications as well.
- **Functional and technical architecture** was subject to a separate Light Impact Assessment during the course of the project, which

<table>
<tr><td></td><td>resulted in the choice for the option “TAP data transfer and EU database an portal”.
› As regards the data input, it is agreed that the initial input will be based on site visits, while further input after upgrade/renewal will be based on assessing the conformity to a documented design.

We have marked in the red boxes the main problems to be addressed <u>in the scope</u> of the current IA:
1. For the users (national authorities and passengers, and in particular PRMs): the data on accessibility collected at the level of stations may not be collected in a consistent, timely, impartial and iterative manner across EU, more precisely:
a. data currently collected at RU/IM level may not be available in the amount and format required by the IoA
b. there is no setting at EU level and no feedback loop on the quality and completeness of the data on the accessibility of stations
2. For the RUs and/or IMs: assessing the accessibility characteristics of the stations and collecting this data may pose administrative burden and, eventually, financial burden. Complexity of data collection at the level of stations can be particularly high when there are more than 1 entity involved in the management of a station</td></tr>
<tr><td>1.2. Main assumptions</td><td>A Light Impact Assessment (qualitative) was performed in 2015 on the assessment of station characteristics. It is assumed that the content and conclusions of the Light Impact Assessment, as endorsed by the PRM TSI WP, can be embedded in the current document and complemented with the quantitative analysis.</td></tr>
<tr><td>1.3. Stakeholders affected</td><td>The main stakeholders affected by the problems are:
› Railway customers (Passengers), and in particular persons with disabilities and persons with reduced mobility
› EU Member State governments, which need to monitor and evaluate progress on accessibility, according to the provisions of the PRM TSI
› Railway Undertakings, to the extent to which they are involved in the management of stations
› Railway Infrastructure Managers, to the extent to which they are involved in the management of stations

The relevance of the problem for each of the categories listed is scored from 1 (lowest relevance) to 5 (highest relevance) in the table below.

<table>
<tr><th>Category of stakeholder</th><th>Importance of the problem</th></tr>
<tr><td>Railway customers (Passengers)</td><td>4</td></tr>
<tr><td>EU Member State governments</td><td>3</td></tr>
<tr><td>Railway Undertakings</td><td>3</td></tr>
<tr><td>Railway Infrastructure Managers</td><td>4</td></tr>
</table>
</td></tr>
</table>

1.4. Evidence and magnitude of the problem	The Impact Assessment performed in 2013 for the latest revision of the PRM TSI looks into the provision related to the inventorying of the accessibility characteristics of stations. From the perspective of the users, it highlights the very high importance of ensuring transparency, which was de facto experienced for the application Stations Made Easy implemented in the UK. As quoted in the PRM TSI revision Impact Assessment (2013), "while benefits have not been monetized, ATOC however reports high satisfaction from customers, associations, authorities and staff. In particular, Stations Made Easy is found a useful reference for RU staff in exerting their duties. The Stations made Easy website (placed in service in 2009) nowadays enjoys 500 000 distinct visitors per year, tendency rising." From the perspective of the entities in charge with collecting the data, the Impact Assessment from 2013 estimates moderate magnitude of the efforts for collecting data and rather high efforts for the IT costs related to the tool for inventorying the data (one time and recurring).
1.5. Baseline scenario	In the absence of a clear description of how the assessment of station accessibility characteristics should be done, the process of collecting, storing, exchanging and retrieving data on the assets at the level of stations in Europe: › may be characterized by inconsistent approaches, leading to a high probability for missing, incomplete or wrong data and thus affecting the expected end users (passengers and PRMs in particular, as well as national authorities); › may lead to unjustified costs for the entities in charge of collecting this data.
1.6. Subsidiarity and proportionality	Considering that the need for setting up the inventory of assets is defined in the text of the PRM TSI, its implementation requires a consistent approach at EU level, in terms of defining a harmonized data model and a consistent approach to data collection and exchange. However, the specificity at national and station level is taken into consideration through, among others: › Analyzing the existing situation in terms of data collection at the level of stations in Europe; › Understanding who plays the role of station manager depending on the national contexts; › Defining and proposing tools for data collection and conversion, which take account of the existing systems at station level. As regards the specific aspect related to the assessment performed in view of the initial data collection, action at EU level is needed in order to ensure a consistent and harmonized approach to data collection, especially that data needs to be collected and aggregated at EU level.

2. Objectives

2.1. Strategic and specific objectives	Mark, as appropriate, **the strategic objective(s) of the Agency** with which this initiative is coherent. ☐ Europe becoming the world leader in railway safety ☒ Promoting rail transport to enhance its market share ☐ Improving the efficiency and coherence of the railway legal framework ☐ Optimising the Agency's capabilities ☒ Transparency, monitoring and evaluation ☒ Improve economic efficiency and societal benefits in railways ☐ Fostering the Agency's reputation in the world The **specific objectives** of this initiative: 1. Ensure **consistent, good quality and impartial assessment** of the station accessibility characteristics across the EU 2. **Improve completeness and quality of data** through iterative feedback from users 3. Ensure **a feasible setting and a timely assessment** (keep administrative burden under control)
2.2. Link with Railway Indicators	This initiative is linked with: RI 4.3 Easiness of use of the Agency's IT tools RI 4.4 Degree of satisfaction of the various end users RI 4.5 Proportion of stations recorded in the PRM TSI inventory of assets out of the total number of stations. For more detailed information see: http://www.era.europa.eu/Document-Register/Documents/Railway%20System%20Report%202016.pdf

3. Options

3.1. List of options	**Baseline** Accessibility characteristics of stations are not assessed and recorded in a systematic way **Option 1a** Self-assessment at the level of stations (one or more entities, depending on the organization of the station management) **Option 1b** Self-assessment at the level of stations, with the possibility for the public to provide feedback **Option 2** Assessment by a commission of in-house independent assessors at the level of stations, with the possibility for the public to provide feedback **Option 3** Assessment by a third party (e.g. railway notified bodies, companies specialized in accessibility audits)
3.2. Description of options	**Baseline** If no action is taken, there will be no systematic collection of data on accessibility characteristics for the stations in Europe. For the passengers, and in particular for persons with disabilities and persons with reduced mobility, this affects the capacity to plan trips. For the national authorities, this leads to a lack of information on the progress towards accessibility. The baseline is breaching the requirements of the PRM TSI in force. **Option 1a** *Self-assessment at the level of stations (one or more entities, depending on the organization of the station management)* The assessment is performed by the station manager and data is provided to the database. In the cases in which more entities are involved in the management of station, it is up to them to share the data collection tasks as long as there will be one entity exchanging the whole set of data with the database. **Option 1b** *Self-assessment at the level of stations, with the possibility for the public to provide feedback* Option 1b includes Option 1a and adds the possibility for the users to provide feedback regarding the data recorded in the database. **Option 2** *Assessment by a commission of in-house independent assessors at the level of stations, with the possibility for the public to provide feedback* This option entails that a certain degree of independence is ensured for the selection and governance of the assessment pool of experts, from among the staff of the station manager (not external experts). In case of multiple entities involved in the management of a station, such a structure could include, if possible, representatives from all the parties involved in the management of the station, thus ensuring a balanced representation in the assessment process.

	Possibility for the public to provide feedback is also ensured (as in Option 1b). **Option 3** *Assessment by a third party (e.g. railway notified bodies, companies specialized in accessibility audits)* This option resorts to the full outsourcing of the assessment and data collection to an independent third party. Options 1 and 2 are based on the assumption that the data collection for feeding the IoA will be done by the entities who are managing the assets subject to inventorying. These entities will bear the cost for data collection. In the case of Option 3, data collection is performed by third parties. It is presumed that the costs are still borne by the entities who are managing the assets subject to inventorying; involving other entities (e.g. Member States) in the data collection and exchange activities is considered as sub-optimal in view of the second phase where resource producers and resource consumers directly exchange the data. However, this does not exclude, depending on national legislation and budget availability, that costs incurred by the entities in charge of data collection could be partly or integrally covered by Member States. Such aspects could be made transparent in the National Implementation Plans.
3.3. Uncertainties/risks	Main risks are related to: › **Baseline** - risk of breaching the PRM TSI provisions, risk of having incomplete and/or inaccurate information if it is collected and provided only by other entities (e.g. collaborative apps), leaving Station Managers with no control on the information relative to their assets › **Option 2** – risk of unfeasible arrangements in the small stations where there is not enough staff to ensure the pool of independent assessors, risk of administrative burden › **Option 3** – risk of administrative burden, high costs and delays, unjustified compared to the requirements and complexity of the task.

4. Impacts of the options

4.1. Impacts of the options (qualitative analysis)

Positive (+) and negative (-) impacts are listed for each option and each category of stakeholder.

Category of stakeholder		***Baseline***
Customers (incl PRM)	+	N.a.
	-	No systematic collection of data on accessibility of stations limits travel by train, especially for PRM
EU Member States	+	N.a.
	-	No systematic collection of data on accessibility of stations limits monitoring and breaches PRM TSI
RUs, IMs	+	Less costs
	-	Less rapid growth in the number of passengers

Category of stakeholder		***Option 1a***
Customers (incl PRM)	+	- Availability of data on stations accessibility
	-	- Some of the data may not be reliable because assessment is not independent - Feedback is not envisaged
EU Member States	+	- Progress towards accessibility is monitorable - Legal compliance to the provisions of PRM TSI
	-	N.a.
RUs, IMs	+	- Reasonably fast and resource consuming (it is expected that many Station Managers have already inventoried at least part of the assets from their stations or could do it with a reasonable amount of effort) - Effort proportional to the complexity of the task
	-	- Costs to perform the assessment - Costs to integrate and centralize data if there are more entities involved in the station management

Category of stakeholder		***Option 1b***
Customers (incl PRM)	+	See Option 1a In addition: Possibility to improve data via feedback
	-	- Some of the data may not be reliable because assessment is not independent
EU Member States	+	Same as Option 1a
	-	N.a.
RUs, IMs	+	See Option 1a In addition: Feedback can be a constructive input to improve
	-	See Option 1a In addition: Effort needed to address the feedback received

Category of stakeholder		***Option 2***
Customers (incl PRM)	+	See Option 1b In addition: Assessment is likely to be more objective, as the degree of independence is higher
	-	N.a.
EU Member States	+	Same as Option 1a and 1b
	-	N.a.
RUs, IMs	+	See Option 1b
	-	See Option 1b In addition: this setting of an in-house pool of independent assessors may be very difficult, especially at the level of small stations.

Category of stakeholder		***Option 3***
Customers (incl PRM)	+	Same as Option 2 – degree of independence is even higher
	-	Due to the limited availability of third party assessors, the process may take longer
EU Member States	+	Same as Option 1a, 1b and 2
	-	N.a.
RUs, IMs	+	See Option 1b This option could have an advantage when the station management is complex More complex checks could be performed (though not necessary)
	-	Higher costs and presumably longer waiting time (unproportionate solution compared to the complexity of the task)

4.2. Impacts of the options (quantitative analysis)

Main costs (C) and benefits (B) have been **quantified** for each the analyzed options per category of stakeholder and overall.

The table below includes the overall discounted costs and benefits for the interval 2016-2030 in total and for each category of stakeholder. All values are expressed in euro. These figures are not to be read as precisely calculated values of benefits and costs, but as the result of all the assumptions taken into consideration, which give a picture of the orders of magnitude of the costs and benefits.

		1a	*1b*	*2*	*3*
Authorities	B	1530750	1530750	1530750	1530750
	C	476190	476190	476190	476190
PRMs	B	50749750	50749750	50749750	50749750
	C	0	0	0	0
Sector	B	53504736	53504736	53504736	53504736
	C	29086822	34254899	34254899	56853031
Overall	B	105785236	105785236	105785236	105785236
	C	29563013	34731090	34731090	57329221

Based on the quantification above, we have calculated the **Net Present Value (NPV)** and the **Benefit/Cost (B/C) ratio** for the period 2016-2030.

	1a	*1b*	*2*	*3*
NPV – euro *(input for section 5.2)*	76222223	71054146	71054146	48456015
B/C ratio *(input for section 5.2)*	3,58	3,05	3,05	1,85

Note 1: The detailed model is included in **Annex 1**.

Note 2: The model in Annex 1 includes reference to all the data sources used in the calculation of C and B. In the estimation of B, the categories of benefits related to passengers were on purpose limited to the PRMs. We however acknowledge that the IoA is useful for all categories of passengers, therefore actual benefits are likely to be higher than the ones hereby estimated.

5. Comparison of options and preferred option

5.1. Effectiveness criterion (options' response to specific objectives)

Based on the findings from section 4.1, we assess the extent to which the various options respond to the specific objectives, from 1-very low response to 5-very high response and we calculate the average score (**effectiveness**).

	Baseline	*1a*	*1b*	*2*	*3*
Ensure ***consistent, good quality and impartial assessment*** *of the station accessibility characteristics across the EU*	1	3	3	4	5
Improve completeness and quality of data through ***iterative feedback from users***	1	2	5	5	2
Ensure ***a feasible setting and a timely assessment*** *(keep administrative burden under control)*	1	4	4	2	1
Overall score	**3**	**9**	**12**	**11**	**8**
Effectiveness (average score)	**1,00**	**3,00**	**4,00**	**3,66**	**2,66**

For **Objective 1**: the consistency, quality and impartiality are likely to be higher when the degree of independence in the assessment is higher.

For **Objective 2**: possibility to provide feedback is envisaged for options 1b and 2.

<table>
<tr><td></td><td>For Objective 3: feasibility of the setting is very low in the case of the third party assessment (high costs and waiting time) as well as in the case of ensuring in-house independence (may not work in small stations).</td></tr>
<tr><td>5.2. Efficiency (NPV and B/C ratio) criterion</td><td>Based on the findings from section 4.2, we rate the overall efficiency of the various options as follows:
› 1 if B/C ratio <1 or NPV <=0
› 5 if B/C ratio >1 and NPV >0
<table><tr><td></td><td>Baseline</td><td>1a</td><td>1b</td><td>2</td><td>3</td></tr><tr><td>Efficiency</td><td>N.a.</td><td>5</td><td>5</td><td>5</td><td>5</td></tr></table></td></tr>
<tr><td>5.3. Summary of the comparison</td><td>We summarize the outcomes of sections 5.1 and 5.2.
<table><tr><td></td><td>Baseline</td><td>1a</td><td>1b</td><td>2</td><td>3</td></tr><tr><td>Effectiveness</td><td>1,00</td><td>3,00</td><td>4,00</td><td>3,66</td><td>2,66</td></tr><tr><td>Efficiency</td><td>5,00</td><td>5,00</td><td>5,00</td><td>5,00</td><td>5,00</td></tr><tr><td>Overall rating</td><td>6,00</td><td>8,00</td><td>9,00</td><td>8,66</td><td>7,66</td></tr></table></td></tr>
<tr><td>5.4. Preferred option(s)</td><td>Based on the overall rating, Option 1b Self-assessment at the level of stations, with the possibility for the public to provide feedback is recommended as the preferred option.

Sector organizations have however drawn attention on potential specific situations in which some of the station managers may still prefer to outsource the data collection to companies specialized in accessibility audits, especially when such data may be safety sensitive. The recommended Option 1b does not exclude that, in specific cases and according to specific needs, Option 3 may be implemented.</td></tr>
<tr><td>5.5. Further work required</td><td>N.a.</td></tr>
</table>

6. Monitoring and evaluation

6.1. Monitoring indicators	We recommend the monitoring of the RIs specified in section 2.2
6.2. Future evaluations	To be further decided once sufficient return of experience is available.

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7. Annex – Model for the quantification of costs and benefits

7.1. Parameters used in the assessment of costs

Parameter	Value	Unit	Explanation	Source
Costs for developing the data model and the IT tool	500 000	€	Data model and IT tool (EC budget)	
Costs for the SM to install the data collection tool	100 000	€	We estimate that 40 entities will use data collection tools	
No of entities in which the data collection tool will be implemented	40	entity		
Costs for the SM to implement a data conversion tool	50 000	€	We estimate that 20 entities will use data conversion tools	
No of entities in which the data conversion tool will be implemented	20	entity		
Costs to adapt the existing processes in the organizations	50 000	€		
Costs for the maintenance of the tool (per year)	10 000	€		
Average costs for data collection or conversion per station - own assessment	750	€/station	Anonymised average of 1,5 days/station with a salary of 500€/day - this includes travel, visit and office work, where needed. Time reported by the sector for the big stations was taken as an overall average (just to ensure even higher room of reserve). Same will be used for data updates, taking into account additionally the frequency.	*Average labor costs in EU: 200€/day with highest national value in Denmark (330€/day), see http://ec.europa.eu/eurostat/statistics-explained/index.php/Wages_and_labour_costs. Initially, the IA used 400€/day (EUROSTAT average *2). Following discussions during the WP in May 2017 and in order to allow reassuring margin for other costs which are non labor-related, the fee used in the estimates was increased at 500€/day (EUROSTAT average * 2,5). This is considered very high as an EU average.* *Anonymized data based on sector input as regards the no. of days/station. Consistent with the estimate of 600€/station for Stations Made Easy*
Average costs for data collection or conversion per station - 3rd party assessment	2 000	€/station	Anonymised average considering the responses from the sector and the size of stations. Same will be used for data updates, taking into account additionally the frequency.	*Anonymized data based on sector input*
Proportion of stations undergoing renewal/upgrade per year	5%	%		
Average costs for recording renewal/upgrades in the IoA	100	€/station		
Proportion of stations for which feedback is recorded in the IoA/year	50%	%		
Average costs for addressing feedback received	50	€/station		
Total number of train stations (EU)	27 000	station		

7.2. Parameters used in the assessment of benefits

Parameter	Value	Unit	Explanation	Source
Number of people with disabilities (EU, 2012)	73 030 600	people	*people over 15 years old	http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=hlth_dpeh130&lang=en
Number of people with disabilities (EU, 2015)	73 674 464	people	*people over 15 years old	value calculated as a trend based on historical data of Eurostat (population's growth trend) Number of PRMs is likely to be higher because it also includes e.g. elderly people with limited mobility.
Share of PRMs who are likely to travel	30,00%	%	own assumption	According to the 2013 Eurobarometer survey, 32% of people aged 15+ never, or very rarely use trains (did not use in the last year). We may therefore assume that the share of people aged 15+ likelt to use the train is in the range of 70-75%. The assumption on 30% of PRMs who are likely to travel, in general, irrespective of the means of transport, is therefore rather conservative. Flash Eurobarometer 382a, http://ec.europa.eu/commfrontoffice/publicopinion/flash/fl_382a_en.pdf, pg.7
Share of travelling PRMs who are likely to use the IoA	30,00%	%	own assumption	Given the novelty of such a EU wide coverage database, attractiveness is likely to be much higher than with existing databases which have a limited scope. Assumption is therefore rather conservative.
Modal split pax rail	8,00%	%		http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=tran_hv_psmod&lang=en http://www.eea.europa.eu/data-and-maps/indicators/passenger-transport-demand-outlook-from-eea/passenger-transport-demand-outlook-from-1
Modal split pax other modes	82,00%	%		http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=tran_hv_psmod&lang=en http://www.eea.europa.eu/data-and-maps/indicators/passenger-transport-demand-outlook-from-eea/passenger-transport-demand-outlook-from-2
Proportion of PRMs who travel for work related purposes	20,00%	%	own assumption	
Proportion of PRMs who travel for non-work related purposes	80,00%	%	own assumption	
Average number of trips per pax per year for work related purposes	60,00	trip/pax/year	own assumption	
Average number of trips per pax per year for non-work related purposes	15,00	trip/pax/year	own assumption	
Time saving per trip per pax due to access to IoA data (when travelling for work related purposes)	1	min/pax/trip	value has been assumed as a possible time saving arising from the inventory of assets usage and is lower in the case of work-related trips which are considered repetitive - therefore a time gain is not reaped at every trip	
Time saving per trip per pax due to access to IoA data (when travelling for non-work related purposes)	5	min/pax/trip	value has been assumed as a possible time saving arising from the inventory of assets usage	
Value of time - work related purposes	20,00	€/h		Based on HEATCO Raport, http://heatco.ier.uni-stuttgart.de/HEATCO_D5.pdf
Value of time - non-work related purposes	10,00	€/h		Based on HEATCO Raport, http://heatco.ier.uni-stuttgart.de/HEATCO_D5.pdf
Average income per passenger for carriers per pax per trip	12,00	€/pax/trip	own assumption	
No. of yearly analyses/reports on progress towards accessibility	1,00	report/year/MS		
Time saved/year for producing the reports due to the IoA	20,00	days		
Value of time for staff from the authorities	400,00	€/day		
No of countries implementing the IoA	28			
PRMs modal shift from other modes to rail due to availability of information	0,50%	% per year		

7.3. Cost calculations

Stakeholder	Option 1a	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EC/Agency	Costs for developing the data model and the IT tool	500 000														
SM	Costs for the SM to install the data collection tool			4000000												
SM	Costs for the SM to implement a data conversion tool			1000000												
SM	Costs to adapt the existing processes in the organizations			3000000												
SM	Costs for the maintenance of the tool (per year)				600000	600000	600000	600000	600000	600000	600000	600000	600000	600000	600000	600000
SM	Costs for data collection/conversion - own assessment				20250000	135000	135000	135000	135000	135000	135000	135000	135000	135000	135000	135000
	TOTAL	**500 000**	-	**8 000 000**	**20 850 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**

Stakeholder	Option 1b / Option 2	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EC/Agency	Costs for developing the data model and the IT tool	500 000														
SM	Costs for the SM to install the data collection tool			4000000												
SM	Costs for the SM to implement a data conversion tool			1000000												
SM	Costs to adapt the existing processes in the organizations			3000000												
SM	Costs for the maintenance of the tool (per year)				600000	600000	600000	600000	600000	600000	600000	600000	600000	600000	600000	600000
SM	Costs for data collection/conversion - own assessment				20250000	135000	135000	135000	135000	135000	135000	135000	135000	135000	135000	135000
SM	Costs for addressing the potential feedback received				675000	675000	675000	675000	675000	675000	675000	675000	675000	675000	675000	675000
	TOTAL	**500 000**	-	**8 000 000**	**21 525 000**	**1 410 000**	**1 410 000**	**1 410 000**	**1 410 000**	**1 410 000**	**1 410 000**	**1 410 000**	**1 410 000**	**1 410 000**	**1 410 000**	**1 410 000**

Stakeholder	Option 3	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EC/Agency	Costs for developing the data model and the IT tool	500 000														
SM	Costs for the SM to install the data collection tool			4000000												
SM	Costs for the SM to implement a data conversion tool			1000000												
SM	Costs to adapt the existing processes in the organizations			3000000												
SM	Costs for the maintenance of the tool (per year)				600000	600000	600000	600000	600000	600000	600000	600000	600000	600000	600000	600000
SM	Costs for data collection/conversion - 3rd party assessment				54000000	135000	135000	135000	135000	135000	135000	135000	135000	135000	135000	135000
	TOTAL	**500 000**	-	**8 000 000**	**54 600 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**	**735 000**

7.4. Benefit calculations

Stakeholder	All options	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
PRMs	Cost savings when travelling by train for work related purposes					2121825	2121825	2121825	2121825	2121825	2121825	2121825	2121825	2121825	2121825	2121825
PRMs	Cost savings when travelling by train for non-work related purposes					5304561	5304561	5304561	5304561	5304561	5304561	5304561	5304561	5304561	5304561	5304561
National authorities	Cost savings for analyses/reports on the progress towards accessibility					224000	224000	224000	224000	224000	224000	224000	224000	224000	224000	224000
RUs	Benefits from PRMs modal shift due to the availability of information					7829533	7829533	7829533	7829533	7829533	7829533	7829533	7829533	7829533	7829533	7829533
TOTAL		-	-	-	-	**15 479 919**	**15 479 919**	**15 479 919**	**15 479 919**	**15 479 919**	**15 479 919**	**15 479 919**	**15 479 919**	**15 479 919**	**15 479 919**	**15 479 919**

7.5. Cash flow (CF) and Net Present Value (NPV) calculation

Option 1a	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Outflows (costs)	**500000**	**0**	**8000000**	**20850000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**
One time initial costs	**500000**		**8000000,00**	20250000,00											
Recurring costs				**600000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**
Inflows (benefits)	**0**	**0**	**0**	**0**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**
Benefits for PRMs					**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**
Benefits for authorities					**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**
Benefits for RUs					**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**
Net flow	-500000,00	0,00	-8000000,00	-20850000,00	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55
Discount factor	0,95	0,91	0,86	0,82	0,78	0,75	0,71	0,68	0,64	0,61	0,58	0,56	0,53	0,51	0,48
Discounted costs	**476190,48**	**0,00**	**6910700,79**	**17153346,60**	**575891,73**	**548468,32**	**522350,78**	**497476,93**	**473787,55**	**451226,24**	**429739,28**	**409275,50**	**389786,19**	**371224,95**	**353547,57**
Discounted benefits	**0,00**	**0,00**	**0,00**	**0,00**	**12128921,24**	**11551353,56**	**11001289,10**	**10477418,19**	**9978493,52**	**9503327,16**	**9050787,77**	**8619797,88**	**8209331,31**	**7818410,77**	**7446105,50**
Net discounted flow	**-476190,48**	**0,00**	**-6910700,79**	**-17153346,60**	**11553029,50**	**11002885,24**	**10478938,33**	**9979941,26**	**9504705,96**	**9052100,92**	**8621048,49**	**8210522,38**	**7819545,12**	**7447185,83**	**7092557,93**
NPV	76222223,11														
IRR	36%														
B/C ratio	3,578296852														
Discount rate	5%														

Option 1b, Option 2	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Outflows (costs)	**500000**	**0**	**8000000**	**21525000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**
One time initial costs	**500000**		**8000000,00**	20250000,00											
Recurring costs				**1275000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**	**1410000**
Inflows (benefits)	**0**	**0**	**0**	**0**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**
Benefits for PRMs					**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**
Benefits for authorities					**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**
Benefits for RUs					**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**
Net flow	-500000,00	0,00	-8000000,00	-21525000,00	14069918,55	14069918,55	14069918,55	14069918,55	14069918,55	14069918,55	14069918,55	14069918,55	14069918,55	14069918,55	14069918,55
Discount factor	0,95	0,91	0,86	0,82	0,78	0,75	0,71	0,68	0,64	0,61	0,58	0,56	0,53	0,51	0,48
Discounted costs	**476190,48**	**0,00**	**6910700,79**	**17708670,77**	**1104771,89**	**1052163,71**	**1002060,68**	**954343,50**	**908898,57**	**865617,69**	**824397,80**	**785140,76**	**747753,10**	**712145,81**	**678234,11**
Discounted benefits	**0,00**	**0,00**	**0,00**	**0,00**	**12128921,24**	**11551353,56**	**11001289,10**	**10477418,19**	**9978493,52**	**9503327,16**	**9050787,77**	**8619797,88**	**8209331,31**	**7818410,77**	**7446105,50**
Net discounted flow	**-476190,48**	**0,00**	**-6910700,79**	**-17708670,77**	**11024149,34**	**10499189,85**	**9999228,43**	**9523074,69**	**9069594,95**	**8637709,47**	**8226389,97**	**7834657,12**	**7461578,21**	**7106264,96**	**6767871,39**
NPV	71054146,35														
IRR	34%														
B/C ratio	3,045836945														
Discount rate	5%														

Option 3	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Outflows (costs)	**500000**	**0**	**8000000**	**54600000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**
One time initial costs	**500000**		**8000000,00**	54000000,00											
Recurring costs				**600000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**	**735000**
Inflows (benefits)	**0**	**0**	**0**	**0**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**	**15479918,55**
Benefits for PRMs					**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**	**7426386**
Benefits for authorities					**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**	**224000**
Benefits for RUs					**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**	**7829533**
Net flow	-500000,00	0,00	-8000000,00	-54600000,00	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55	14744918,55
Discount factor	0,95	0,91	0,86	0,82	0,78	0,75	0,71	0,68	0,64	0,61	0,58	0,56	0,53	0,51	0,48
Discounted costs	**476190,48**	**0,00**	**6910700,79**	**44919555,12**	**575891,73**	**548468,32**	**522350,78**	**497476,93**	**473787,55**	**451226,24**	**429739,28**	**409275,50**	**389786,19**	**371224,95**	**353547,57**
Discounted benefits	**0,00**	**0,00**	**0,00**	**0,00**	**12128921,24**	**11551353,56**	**11001289,10**	**10477418,19**	**9978493,52**	**9503327,16**	**9050787,77**	**8619797,88**	**8209331,31**	**7818410,77**	**7446105,50**
Net discounted flow	**-476190,48**	**0,00**	**-6910700,79**	**-44919555,12**	**11553029,50**	**11002885,24**	**10478938,33**	**9979941,26**	**9504705,96**	**9052100,92**	**8621048,49**	**8210522,38**	**7819545,12**	**7447185,83**	**7092557,93**
NPV	48456014,58														
IRR	14%														
B/C ratio	1,845223664														
Discount rate	5%														