STAFFER

EUROPEAN RAIL SKILLS ALLIANCE

Identification of Qualifications Standards

DELIVERABLE 4.2 – FINAL REPORT

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TABLE OF CONTENTS

TABLE OF FIGURES

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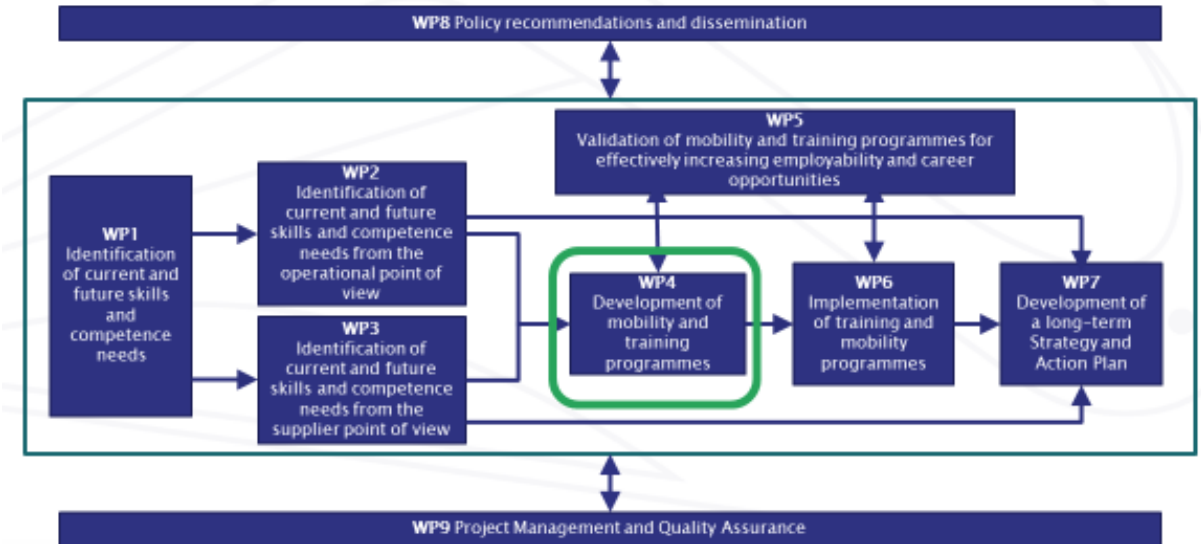
1 MAIN OBJECTIVES

Before giving more details on task 4.2 and its aims, it is important to state how the identification of qualification standards fits within the project. In order to do so, we will first go through work package 4 as a whole. We will then focus on task 4.2 and its place within the project and more specifically within its own work package. Lastly, we will see how the identification of qualification standards is related to other tasks parallel to it.

1.1 Aims of WP4

Work package 4, named "Development and mobility of training programmes", started at the beginning of the STAFFER Project (Skill Training Alliance For the Future of European Rail system) in November 2020 and will last until October 2022. As the figure below will show, this work package is deeply interconnected with work packages 2 and 3 and is reliant on their outputs. WP4's results, in turn, are expected to be beneficial for both WP5 and WP6.

FIGURE 1 – OVERALL STAFFER WP STRUCTURE



The main objectives of this work package are:

- **Mapping the main educational providers**
- **Identifying recognized qualification standards**
- **Considering the existing VET and higher educational programmes**
- **Designing/complementing existing and new training curricula**

In order to succeed in reaching these objectives, work package 4 is split into five different tasks, which are listed below.

- **Task 4.1 – Map of the existing educational providers and programmes (M1-M6)**
- **Task 4.2 – Identification of Qualification Standards (M7-M12)**
- **Task 4.3 – Benchmarking the existing programmes and catalogue of the best practices (M7-M12)**
- **Task 4.4 – Development of mobility and training programmes in the field of cross-border railways, communication and language (M13–M24)**
- **Task 4.5 – Development of mobility and training paths, programmes and courses (M13-M24)**

The mapping of the main educational providers is now covered by task 4.1. The evaluation of existing VET and higher education programmes is itself covered by Task 4.3, which ends on M12. Designing/complementing existing and new training curricula comes from the results of both task 4.4 and task 4.5, which are to end on M24. Lastly, qualification standards identification is the subject matter of task 4.2, which is detailed in the report.

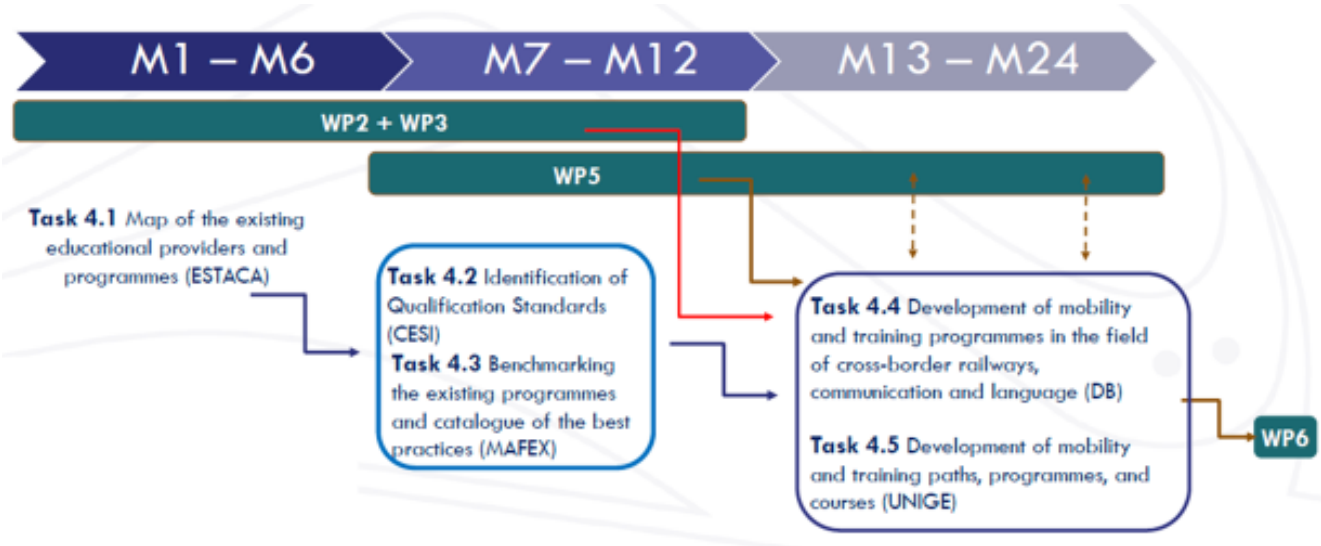
1.2 Aims of WP4.2

At first glance, it can appear quite difficult to describe a qualification standard. What should be considered as a "qualification standard"? Would a simple yes or no answer to "is that given person qualified for that skill" suffice? After looking at the inputs from previous work packages, and after exchanges within WP4 and with partners from Task 2.2, Task 3.2 and Task 5.1, it appeared obvious that such a narrow description of qualification standards would simply lead to its inapplicability. The agreed upon decision was then to establish some tools (which are described in more details in the third chapter of this report). As mentioned before, the decision was taken thanks to previous inputs. Obviously, Task 4.2 should not be seen in a vacuum and it is relevant to mention the place of task 4.2 in its ecosystem, namely in regard to the whole work package 4. Something we did not anticipate at the start of this task was how "central" it is in its timeframe (M7 to M12). This centrality will be further discussed in 1.2.2 of this report.

1.2.1 Within WP4

As the timeline following this paragraph shows, task 4.2 and task 4.3, are directly linked with task 4.1, whose aim was to map the existing educational providers and programs. It is also important to note that both 4.2 and 4.3 outputs are also relevant to the two last tasks of the work package 4, namely task 4.4 and task 4.5.

FIGURE 2 – WP4 – TIMELINE WITH TASK OWNERS



While mapping the existing educational providers and programmes is definitely an useful precondition in order to know what of the qualification standards can be deemed applicable to the rail sector, it is also worth noting that this map is key to Task 4.3 as benchmark.

Furthermore, though task 4.4 might benefit from the qualification standards established in the current task, inputs from task 4.2 are key for task 4.5. In order to be able to develop training paths, programmes and courses, it seems critical to get a couple of key information out of the present task:

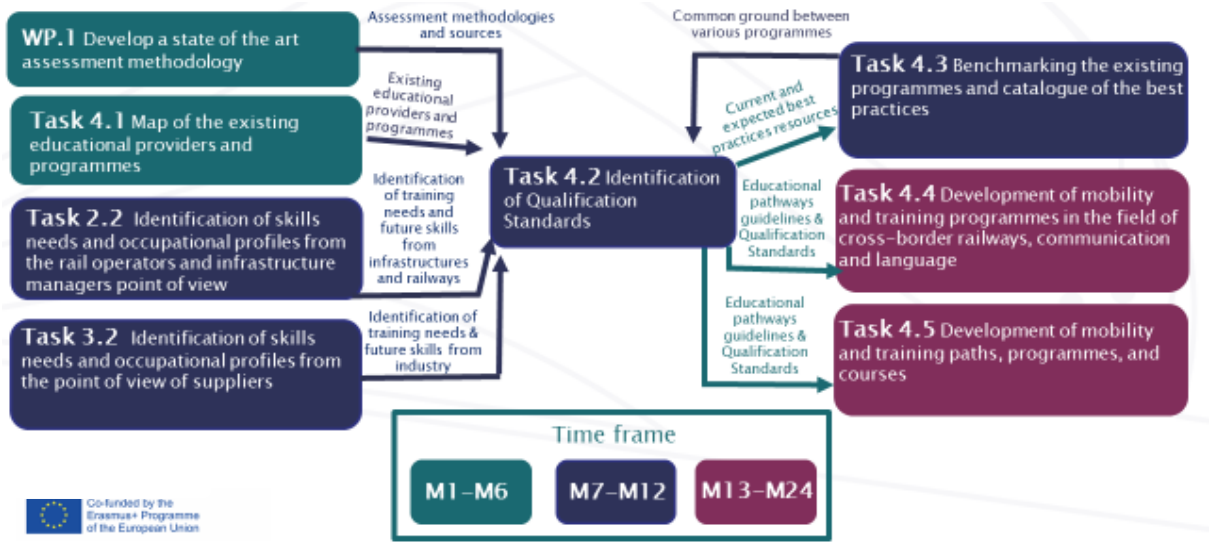
- What is a qualification standard i.e. the minimum requirement to meet for a specific skill or occupation.
- Which skills seem most urgent/relevant to be applied on.

The timeline above shows task 4.2 and task 4.3 are happening in parallel. This is due to the fact they are dependent on inputs from the same work package. One key aspect of the STAFFER project identified in this task is how every task is linked to another, hence the need for a proper and clear communication between partners. This applies not only to former and following tasks, but also to those happening at the same time.

1.2.2 Interconnections with other Work Packages

Throughout the roll out of task 4.2 one aspect became obvious: how the identification of qualification standards was not only linked to other topics pertaining to the proper work package, but also with other work packages both in their first (M1-M6) and second (M7-M12) phase. The graph you can see in figure 3, as established with task leaders from other work packages (WPs), clearly shows to what extent task 4.2 needs inputs from the different partners.

FIGURE 3 – INTERCONNEXIONS BETWEEN WP4.2 AND OTHER WORK PACKAGES



Please note that one task seems to be missing from the above scheme. Indeed, Task 5.1 ("Identification of criteria and measurable indicators to evaluate employability and carrier opportunities" / leaded by the University of Belgrade) is set in the same timeframe as the present task and its results, among others, will be of use for the development of mobility and training paths, programmes, and courses (task leader: UniGe).

As shown by the colour coding, the various tasks mentioned in figure 3 are happening at different times. It is also interesting to see that task 4.2 is dependent on inputs from task 2.2 (leaded by DB) and task 3.2 (leaded by Siemens) which are happening at the same time. This link of dependence was only identified during task 4.2 roll out. Its impacts and the solution to overcome difficulties linked to this situation will be further discussed in this report.

2 METHODOLOGY

One key aspect to mention before going into details on the methodology for the elaboration of qualifications standards is to mention one limitation shared by the project globally and even more so in our current health context: remote working.

As mentioned previously the current task is heavily reliant on data from other tasks. This makes the need for a good and regular communication even more critical than initially anticipated.

However, this potential issue was naturally overcome thanks to a clear identification of relevant inputs for the identification of qualification standards. Moreover, in order to fine-tune both the aim and content of said qualification standards, it was critical to base the work on inputs from WP1 as well as WP4.1, but also on inputs from task 2.2 and 3.2.

This chapter will therefore focus on three different aspects. First, the data recollection from previous and concomitant tasks will be covered. Then, we will detail the analysis of the data. Lastly, we will explain the qualification building method.

2.1 Data recollection

Before describing our data recollection process, it is important to state that this process is to be understood in two different ways. First, we will describe the process of recollecting information from other work packages and tasks. In a second time, we will go through the methods used within task 4.2 to collect data from this phase's stakeholders.

Data recollection started at the very beginning of task 4.2 thanks to the inputs from finalised work packages and tasks, namely work package 1 "Identification of current and future skills and competence needs" and task 4.1 "Map of the existing educational providers and programmes". Work package 1 and its final report listed identified future trends, shown in figure 4, which helped in knowing which subjects appear relevant or critical through surveys and interviews.

For the qualification standards to be meaningful and useable not only during but also after the project, it appeared that task 4.2 needed inputs from two other concomitant tasks. Indeed, without information from both task 2.2 (i.e. Identification of skill needs and occupational profiles from the rail point of view of operators and infrastructure managers) as well as task 3.2 (i.e Identification of skill needs and occupational profiles from the rail point of view of suppliers) the risk was to create qualification standards which were not fit for previous findings on key profiles and/or skills.

FIGURE 4 – RAILWAY FUTURE TRENDS – INPUTS FROM WP1

Society	*Technical changes*	*Environmental and politics*	*Economics and market*
Silver Society	*5G and beyond*	*Politics*	*Platforms of digital eco-systems*
Gender Shift	*Digital Provisioning*	*Neo-ecology*	*Renewable Energy*
Health	*Distributed Ledger Technologies*	*Climatic-political regulation*	*New Mobility*
New Work	*Artificial Intelligence*	*Security*	*Sustainable Management*
Sustainability	*Quantum Computing*	*European Rail Area*	*Globalization*
Urbanization	*Embedded Payment*	*Smart and sustainable mobility strategy*	*Transnational rail freight corridors*
Knowledge Management	*Internet of Things*		*Transnational rail passenger corridors*
Talent shortage	*Location Technologies*		

As the title of both task 2.2 and task 3.2 suggests, a share of their activities was to identify relevant skills that would complete the results gathered by the first work package. Both tasks started at the same time and within the same timeframe as task 4.2, as stated in paragraph 1.2.2 of this report. This led to a conscious effort from all parties in exchanging on a regular basis about each other findings. This took two distinct forms: one-on-one exchanges between task leaders and co-leaders and, more global meetings with stakeholders from concomitant tasks called “M7 meetings”. These sessions had the aim of informing others on our status, as well as identifying pain points that could collectively be raised. Members of this M7 group were:

- DB
- MAFEX
- University of Belgrade
- UniGe
- wmp consult
- Siemens
- CESI

Thanks to these instances and to a good communication channel, we were able to gather occupational profiles from WP2.2 as well as key skills from WP3.2. From train operators and infrastructure managers' perspective, the three most impacted profiles are train driver / traffic control centre staff / infrastructure and maintenance occupational profiles. Regarding skills identified by both experts and task 3.2 stakeholders, the five most critical are the following: Lifecycle management – Holistic system approach – Digital technologies as tool to connect working approaches - Collaboration – Problem solving. Due to the conjunction of these three tasks, the aforementioned skills and profiles were determined towards the end of the allocated time.

Not only was it necessary to recollect data from other work packages, but also from task 4.2 stakeholders. In this context, "stakeholders" encompasses three different profiles that were diversely involved both time and content-wise.

- **Original stakeholders: they were identified since the beginning of the project, all come from academia. (UniGe, AUTh, CESI, CNAM, CTU, ESTACA, UASFHE, UASSP, FF, HTL Mödling, SGH, TUD, UNIROMA1, UB)**
- **"Broader circle" stakeholders: after exchanges with our academic partners during our first workshop, held on July 6 2021, it appeared important to involve structures participating in task 2.2 as well as 3.2.**
- **Other stakeholders: leaders from other adjacent tasks. These stakeholders were mainly solicited through "M7 & Next steps" meetings.**

There were various possible methods to choose from regarding how to gather inputs from both original as well as broader circle stakeholders. The two main ones were either to go with a blend of broad surveys and more restricted experts' interviews, or to have all stakeholders gathered in a workshop setup. Decision was taken not to go with surveys and interviews. Though this was the preferred process for many task leaders (e.g. Task 2.2, Task 3.2), it appeared difficult to put in place for all stakeholders and expecting results within six months. In order to

get results fast, it was deemed more efficient and appropriate to gather all stakeholders, which then only meant the "original partners", in a workshop setup. This type of organization proved to have some limitations that will be further developed in chapter 5 "challenges and opportunities".

2.2 Data analysis

Data analysis in the context of task 4.2 covers inputs from all previously mentioned tasks. More specifically from the identification of occupational profiles from the point of view of both operators and suppliers. Though other tasks helped in having a broad picture of trends and the skills linked to them, it was vital at this stage of the project to receive inputs from task 2.2 and 3.2. One key question arising at the very beginning of the task was, in a few words, "How far should/do we want to go?" This interrogation splits into various other queries, such as:

- How many skills and/or profiles do we want to map?
- How many can we map in the timeframe of this task?
- Which skills to prioritise over others?

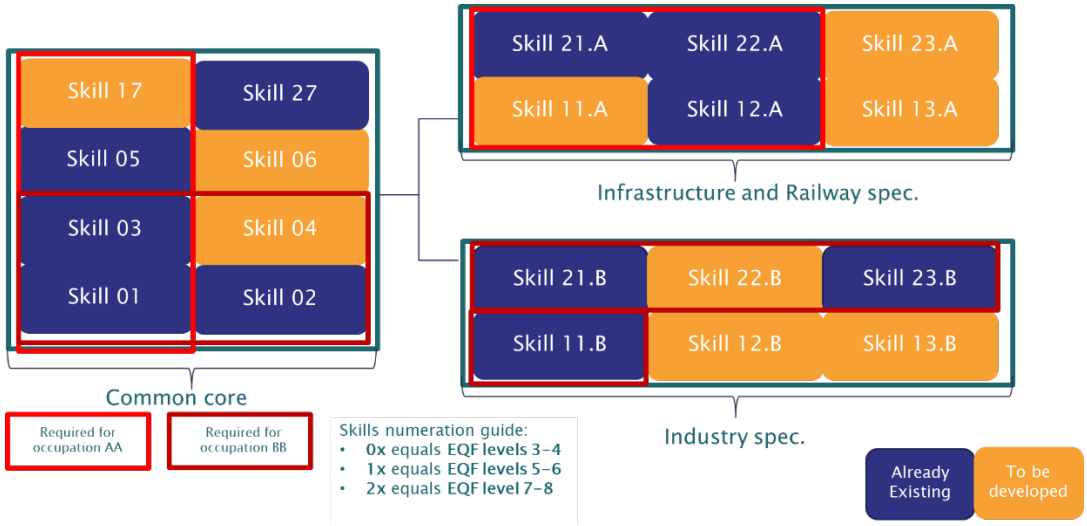
The first question of this list might seem easy to answer with a simple "as many as possible". However, it results somewhat difficult to give it a clear response. The ideal would be to be able to map all of them. To do so would require a knowledge of all current and future skills, which is too broad of a project to cover fully within the STAFFER framework. This leads to the second question on how many skills and profiles can we map. After considering inputs from task leaders on 2.2 and 3.2 as well as original 4.2 stakeholders, it appeared clear we should narrow the number of skills to a digestible number. This decision was confirmed in exchanges within the "M7 & Next steps" group. On its own task 2.2 decided to go for three most relevant profiles. On task 3.2 side, three hard skills and two soft skills were identified. These were therefore the number of skills to apply the method on.

However, the way industrial partners' label their skills does not exactly fit the requirements for the identification of qualification standards to apply on a "skill" in the academic sense of the word. Hence, the need to find a way to turn inputs from task 2.2 and task 3.2 into something useable for the whole work package 4. This was the objective of the last of the three half-a-day workshops spanning from July 6 to October 12.

2.3 Qualification building

The initial perspective on qualification standards was to be able to map, for each occupational profile, already existing skills as well as skills to be developed. Another core idea was to be able to trace a "common core" of skills as well as specialization for one specific branch. For example, the idea was to be able to map what would be relevant for an engineer skill-wise on a global aspect and then be able to identify specializations in either infrastructure or industry, as figure 5 below shows.

FIGURE 5 – DELIVERABLE VISUALISATION EXAMPLE OF SKILL QUALIFICATION – JUNE 2021



As mentioned in a previous chapter, the choice was to use a workshop-approach to the identification of qualification standards. Two were initially planned. The participants were members of the original stakeholders' circle. The first one, happening on July 6, had the objective of establishing a common and agreed-upon set of tools for skills recollection. Thanks to inputs from our partners, we established two tools using a common language.

- First, a "skill recollection form": a word document giving relevant information on one specific skill (EQF level, assessment modalities, short description, learning outcomes etc…).
- Second, a "groups to skill recollection form": an excel sheet whose purpose is to gather inputs from task 2.2 and task 3.2. Its objective was also to be able to start from the "occupational profile groups" to skills while identifying if said profiles and/or skills were "emerging" (new), "changing" (already existing but evolving) or only "existing".

During this first workshop, two main comments arose. First, the need to align closely with the direction set by "former" tasks, in this case the identification of occupation profiles and skills from both perspectives. Second, the need to involve more directly industrial partners (in the broad sense of the word). Decision was taken to invite members of the broader circle to join the second workshop, scheduled for September 9, and work in subgroups with academics.

In between the first and second workshop, two major events happened. First, the visualisation illustrated by figure 5, emitted at the beginning of the phase, became obsolete between the first and second workshop as it became apparent relevant occupational profiles and skills from previous phases would only be available nearing the end of their respective tasks. Hence, not leaving enough time to apply this method. Second, thanks to a frequent exchange with other task leaders, we were able to gather the ESCO occupational profiles deemed relevant by both task 2.2 as well as task 3.2. ESCO, as defined by the ESCO portal[1] *"is the multilingual classification of European Skills, Competences, Qualifications and Occupations."* It *"identifies and categorises skills, competences, qualifications and occupations relevant for the EU labour market and education and training."* Once received, this data was concatenated into one huge database incremented with a potential EQF level relevant to each profile. This database was shown during the second workshop.

Scheduled on September 9 the main objectives of the second workshop were to select a small number of profiles to work on as well as establishing a shared perspective between academics from the original stakeholders' circle and participants from the broader circle. This half-a-day workshop saw many questions. Most of them regarding two topics.

- How to make sure EQF levels within the database are relevant?
- Who should decide which profiles and/or skills are the priority?

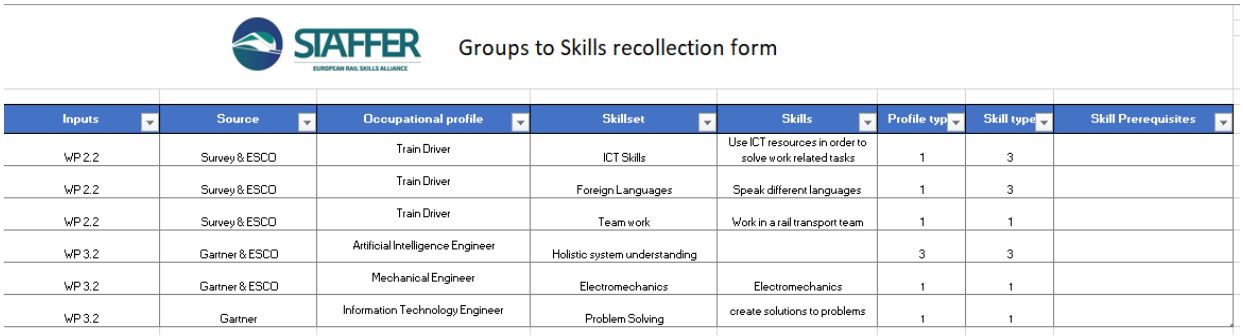
It is important to note that, at the time of the second workshop, a restricted number of skills and/or profiles was yet to be finalised by task 2.2 and task 3.2. This led to a shorten workshop (3 hours only) and the need for a further half-a-day workshop to be held somewhere in October. In the meantime, in order to keep participants involved they received the database and had to fill in their inputs on relevant EQF levels for each profile.

In between workshop 2 and 3 there was a need for clarification on how to proceed with the EQF level qualifications. The current database, established since then, has now taken into account the fact that EQF levels for each profile can be a range rather than a single number. For example, the ESCO operational profile for rail layer can enter the EQF level 3 or level 4

[1] https://ec.europa.eu/esco/portal/home

category as, depending on your country of origin, differences might apply. At the same period, task 4.2 received inputs by the original date for the third workshop that was initially scheduled on October 1st. In order to prepare it, the idea was to invite a few partners from the broader circle to a short pre-workshop on one specific skill in order to map one specific skill and present the new version of the "groups to skill recollection form" incremented with inputs from operational profiles from the database, as shown in figure 6. The "profile type" and "skill type" kept the same value as "emerging/changing/existing" were in the first iteration of the file. This pre-workshop was held with partners from Siemens and Alstom on September 29, with the example of cybersecurity skill identified as a trend by task 3.2.

FIGURE 6 – GROUPS TO SKILL RECOLLECTION FORM – SECOND ITERATION – SEPTEMBER 29, 2021



Inputs	Source	Occupational profile	Skillset	Skills	Profile typ	Skill type	Skill Prerequisites
WP 2.2	Survey & ESCO	Train Driver	ICT Skills	Use ICT resources in order to solve work related tasks	1	3	
WP 2.2	Survey & ESCO	Train Driver	Foreign Languages	Speak different languages	1	3	
WP 2.2	Survey & ESCO	Train Driver	Team work	Work in a rail transport team	1	1	
WP 3.2	Gartner & ESCO	Artificial Intelligence Engineer	Holistic system understanding		3	3	
WP 3.2	Gartner & ESCO	Mechanical Engineer	Electromechanics	Electromechanics	1	1	
WP 3.2	Gartner	Information Technology Engineer	Problem Solving	create solutions to problems	1	1	

During this exercise it appeared clear that previous tasks 2.2 and 3.2 still needed to refine their inputs as the "skillset" part was too broad to be properly useful and skills (mostly from ESCO) were also, on their part, too broad to be of use in an academic context such as with task 4.2 original stakeholders. This led to internal discussions within 4.2 on the relevance of maintaining the third workshop on October 1st. This idea was made even stronger thanks to an exchange with partners from Hitachi Rail on their involvement as member of the broader circle. They suggested partners from this circle be solicited through surveys or files to be filled in, such as what happened for the validation of EQF levels on the database, rather than with a too time-consuming workshop approach. Thanks to both inputs and an exchange with WP4 co-leaders the third workshop was postponed to October 12 and reinstated in its original form with only academic partners. This enabled task 4.2 to receive inputs on three hard skills and two soft skills from the task 3.2 community on October 8.

The third workshop only included academic stakeholders, as it was the case with the first one. It had two main objectives: determining a common method to go from previous tasks inputs to easy-to-use skills and using one concrete skill example to fill in together one skill recollection form in word template. In order to do so, the group decided to describe learning objectives using action verbs and, when in doubt, revert to a revised bloom's taxonomy that lists the various

verbs that can be used to describe contexts and realities. The excel sheet "groups to skill recollection" went through a third and final versioning in order to better fit with stakeholders' needs. Compared to figure 6's table, this last iteration got rid of the "sources" column and created a new layer of skill details. The last edition of this table (see figure 8) now has "basic skill trends" which correspond to inputs from previous work packages (namely, for now, task 3.2). It is followed by "skillsets" which acts as an umbrella term for various connected skills (e.g. "BIM"). "Skills" are, on their part, the title of the "skill recollection form" word document and easier to assess information. At the end of the workshop guidelines were sent for review and inputs in the form of completed skill recollection form were asked.

This whole endeavour led to the creation of three "direct" tools: a "Skills recollection guidelines", a "skill recollection form" template and the excel sheet enabling the conversion of inputs from previous tasks to applicable skills. It is however important to note the creation of another tool which might be of better use in the future: the "WP2.2 and 3.2 Occupational Profiles Database". These tools will be presented with a higher level of details in the next section of this report.

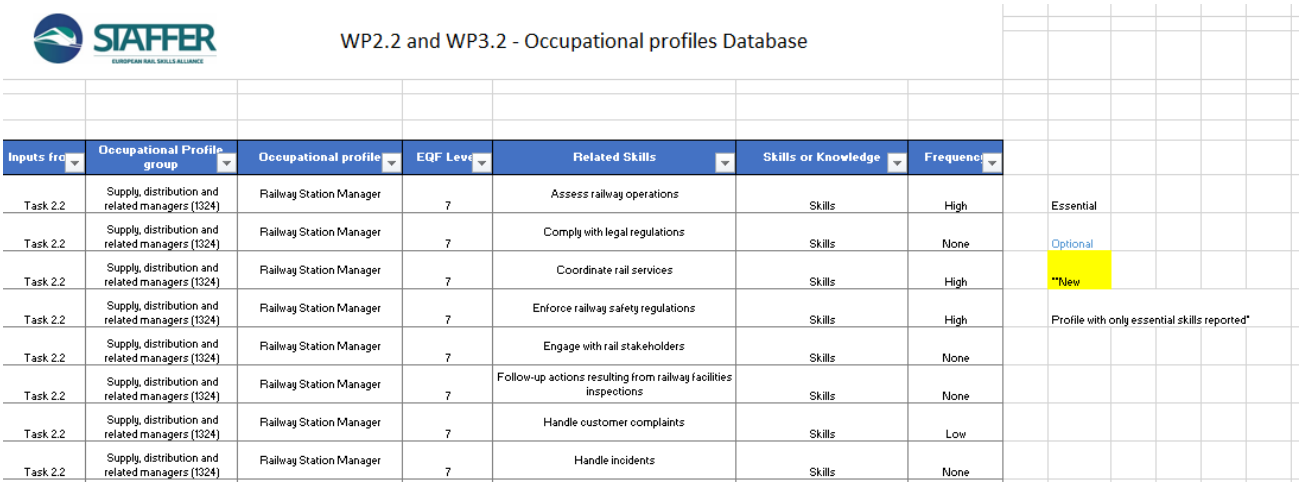
3 TOOLS

As mentioned in the previous chapter of this report, the tools built during task 4.2 are mostly directly linked to its activity. However, the "WP2.2 and 3.2 – Occupational Profiles Database" is rather different, as its intent is to concatenate ESCO inputs from operators and suppliers.

3.1 WP2.2 and 3.2 Occupational Profiles Database

To give more details about what was written in the introduction for chapter 3, it became apparent before the second workshop that there was a need to concatenate inputs on ESCO occupational profiles in one file. The idea was to be able to use said file as a basis for reflexion on where to start to apply the qualification standards first.

FIGURE 7 – WP2.2 AND 3.2 OCCUPATIONAL PROFILES DATABASE – OP DATABASE SHEET EXTRACT



WP2.2 and WP3.2 - Occupational profiles Database

Inputs fro	Occupational Profile group	Occupational profile	EQF Leve	Related Skills	Skills or Knowledge	Frequenc
Task 2.2	Supply, distribution and related managers (1324)	Railway Station Manager	7	Assess railway operations	Skills	High
Task 2.2	Supply, distribution and related managers (1324)	Railway Station Manager	7	Comply with legal regulations	Skills	None
Task 2.2	Supply, distribution and related managers (1324)	Railway Station Manager	7	Coordinate rail services	Skills	High
Task 2.2	Supply, distribution and related managers (1324)	Railway Station Manager	7	Enforce railway safety regulations	Skills	High
Task 2.2	Supply, distribution and related managers (1324)	Railway Station Manager	7	Engage with rail stakeholders	Skills	None
Task 2.2	Supply, distribution and related managers (1324)	Railway Station Manager	7	Follow-up actions resulting from railway facilities inspections	Skills	None
Task 2.2	Supply, distribution and related managers (1324)	Railway Station Manager	7	Handle customer complaints	Skills	Low
Task 2.2	Supply, distribution and related managers (1324)	Railway Station Manager	7	Handle incidents	Skills	None

Essential

Optional

**New

Profile with only essential skills reported*

As illustrated above this first out of eight sheets of the database is actually the recollection of all ESCO profiles identified by previous tasks. The different columns stand for:

- "Inputs from": Where does the information come from? From which task?
- "Occupational Profile group": ESCO Occupational Profile group the profile relates to.
- "Occupational Profile": ESCO naming of job position.
- "EQF Level": The EQF level relevant profile-wise. Is this a level X or Y position?
- "Related skills": Skills as labelled by ESCO
- "Skills or Knowledge": Does this skill qualify as a skill or as a knowledge according to ESCO?
- "Frequency": How often is this skill or knowledge encountered in the database (High: more than thrice/ Low: twice or thrice / None: once)

The last two columns' contents can be written in blue. If so, this means the skill or knowledge in question is optional in regard to the ESCO database. In addition, some profiles might appear yellow in the database. This means it does not link directly to ESCO but rather it is an expansion of it where skills still need to be built.

The other seven sheets in this excel database are:

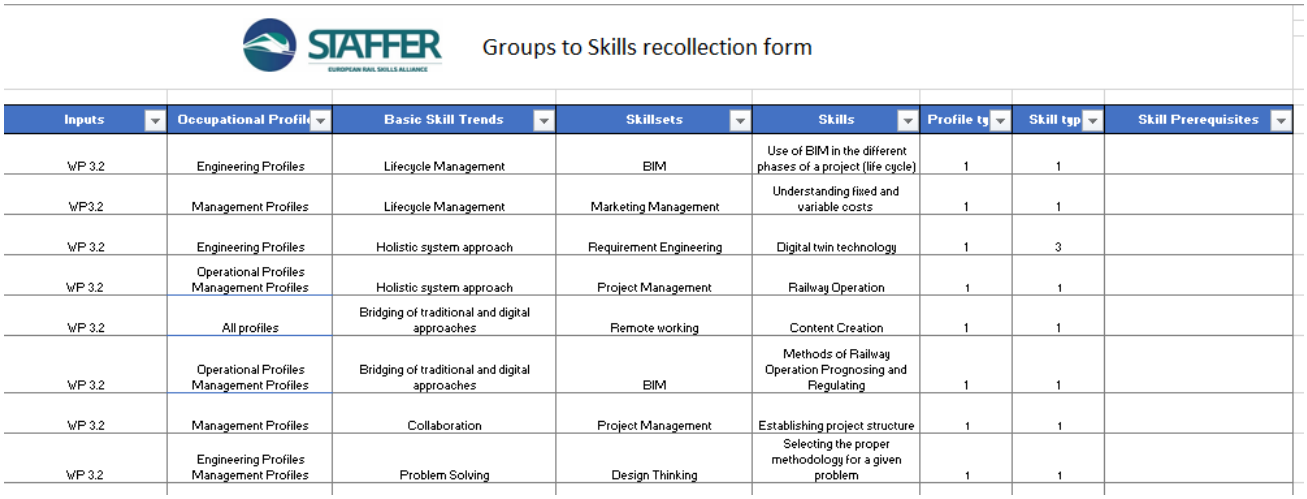
- "Estimated EQF level": A two-column table with initial EQF evaluation and final one once partners' inputs received.
- "Most prevalent EQF levels": The idea behind this sheet is to make sure a broad variety of EQF levels are covered and not only level 6 and upwards.

- "Most common skills": Which ESCO skills are the most encountered
- "Future skills": a table listing future skills and knowledge which are seen as particular important
- "MCS detailed": Where are the most common skills? In which profiles?
- "Fullest ESCO profiles": Which profiles have the most skills and knowledge
- "Pivot Table": the necessary tool to build other sheets, if required, by the next steps of the project.

3.2 Groups to skills recollection form

The groups to skills recollection form evolved throughout task 4.2 in order to be of the best use possible not only within task 4.2 but also for the next steps of the STAFFER project. Its current form comes from a basis done by CESI and then refined through inputs by mostly task 4.2 stakeholders and, to a lesser extent, tasks 2.2 and 3.2 stakeholders.

FIGURE 8 – WP4.2 GROUPS TO SKILLS RECOLLECTION FORM



Inputs	Occupational Profil	Basic Skill Trends	Skillsets	Skills	Profile ty	Skill typ	Skill Prerequisites
WP 3.2	Engineering Profiles	Lifecycle Management	BIM	Use of BIM in the different phases of a project (life cycle)	1	1	
WP3.2	Management Profiles	Lifecycle Management	Marketing Management	Understanding fixed and variable costs	1	1	
WP 3.2	Engineering Profiles	Holistic system approach	Requirement Engineering	Digital twin technology	1	3	
WP 3.2	Operational Profiles Management Profiles	Holistic system approach	Project Management	Railway Operation	1	1	
WP 3.2	All profiles	Bridging of traditional and digital approaches	Remote working	Content Creation	1	1	
WP 3.2	Operational Profiles Management Profiles	Bridging of traditional and digital approaches	BIM	Methods of Railway Operation Prognosing and Regulating	1	1	
WP 3.2	Management Profiles	Collaboration	Project Management	Establishing project structure	1	1	
WP 3.2	Engineering Profiles Management Profiles	Problem Solving	Design Thinking	Selecting the proper methodology for a given problem	1	1	

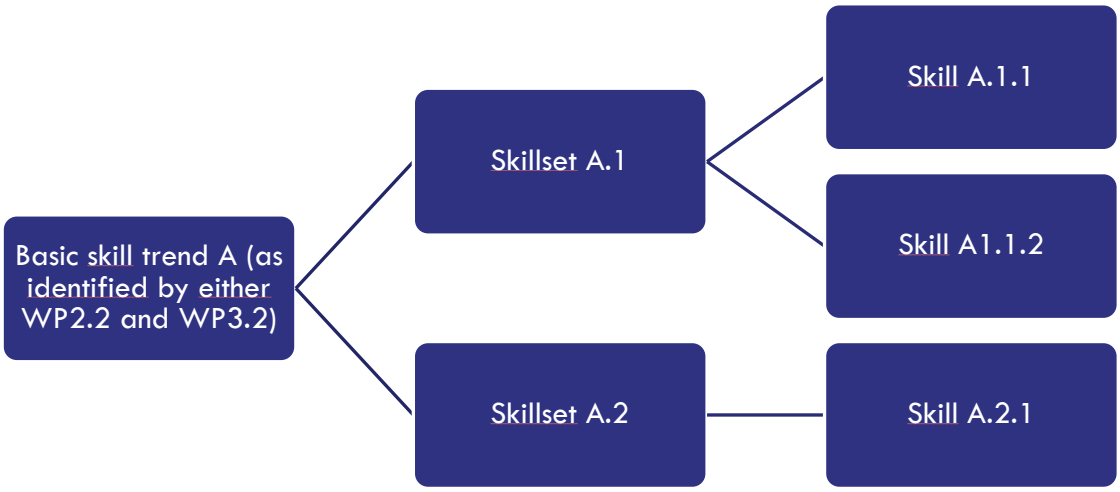
This table is consolidated thanks to inputs given during the workshop held on October 12. The columns mean the following:

- "Inputs": Where does the basic skill trend comes from? Task 2.2 or task 3.2?
- "Occupational Profiles": To whom the skill applies. Is it engineering, management or operational profiles?
- "Basic skill trends": What has been identified by previous tasks as key? For task 3.2, the basic skill trends are lifecycle management, holistic system approach, bridging of traditional and digital approaches, collaboration and problem solving.
- "Skillsets": under which common umbrella could the skills be included?

- "Skills": A competence or knowledge that is linked to learning objectives and is the object of the "skill recollection form" tool.
- "Profile type": Are skills linked to an existing, emerging or new profile?
- "Skill type": Are the skills listed existing (nothing changes), emerging (were already present but are gaining more weight or changing), or new?
- "Skill prerequisites": Is there any skill necessary before accessing the listed skill?

As the excel sheet shows, one skill does not necessarily correspond to just one skillset, much as one skillset is not necessarily linked to only one basic skill trend. In other words, one skill can be found in multiple skillsets as one skillset can be found in various basic skill trends. For example, "project management" can either be found under the basic skill trend "holistic system approach" or under "collaboration".

FIGURE 9 – ILLUSTRATIVE FLOW CHART ON CONNECTIONS BETWEEN DIFFERENT LEVELS – GROUPS TO SKILLS



3.3 Skill recollection form

One key element in the tools developed during task 4.2 is the skill recollection form. The idea of this document, in word format, is for everyone involved in the project to be able to use a common structure with the same kind of vocabulary and a common way of describing content, e.g. prerequisites and learning outcomes.

FIGURE 10 – SKILL RECOLLECTION FORM – ESTABLISHING PROJECT STRUCTURE EXAMPLE

Establishing project structure	
EQF Levels	6 – 8
Occupational Profile Groups this applies to	Management profiles
Short Description	Establishing an effective and efficient project project structure
Learning outcomes	By the end of this learning sequence the trainee will be able to: • Idetify project goal • Predict assets (people, budget, time) required to conduct the project • Design project structure in a way, that allows to connect it with traditional department structure of a firm
Required Skills	*General project managment knowledge*
Follow-up Skills	*Which skills would, according to you, have this skill as a prerequisite ?*
Content	Module 1. Identify project goals – lecture + excercise (students evaluate sample goals, create their own proposals, evaluate other groups' proposals) Module 2. Creating project structures – lecture + case study, firm structure description and project goal are given, studets establish project structure
Educational Methods	
Assessment Methodologies	Written exam / Creating a case study
ECTS Credits	
Recommended Duration	

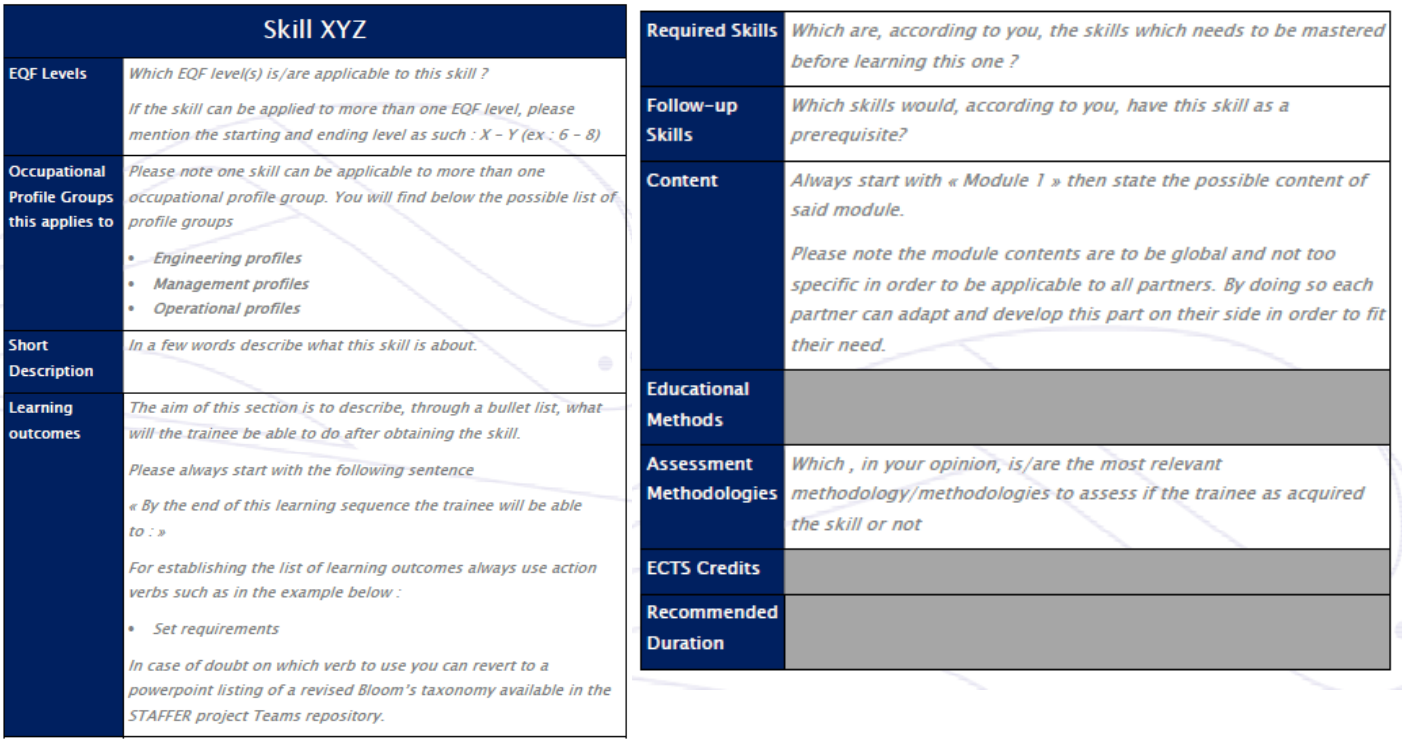
The meaning of all different lines will be explicated in the last tool: the filling guidelines. It is, however, important to note the grey lines are not to be filled in at this stage of the project. These aspects will be filled if needed by academics regarding their local status and constraints.

The idea is to provide a possible mean to trace methods and duration in the same manner throughout the companies and education facilities.

3.4 Skill recollection form – Filling guidelines

During the third workshop, it appeared critical to make sure everyone would fill the skill recollection form in a similar way even after the end of task 4.2. This prompted the creation of guidelines whose purpose is to help any potential stakeholder to understand what kind of input is needed from them in the different categories of the form.

FIGURE 11 – SKILL RECOLLECTION FORM – FILLING GUIDELINES



Skill XYZ	
EQF Levels	*Which EQF level(s) is/are applicable to this skill ?* *If the skill can be applied to more than one EQF level, please mention the starting and ending level as such : X – Y (ex : 6 – 8)*
Occupational Profile Groups this applies to	*Please note one skill can be applicable to more than one occupational profile group. You will find below the possible list of profile groups* • *Engineering profiles* • *Management profiles* • *Operational profiles*
Short Description	*In a few words describe what this skill is about.*
Learning outcomes	*The aim of this section is to describe, through a bullet list, what will the trainee be able to do after obtaining the skill.* *Please always start with the following sentence* *« By the end of this learning sequence the trainee will be able to : »* *For establishing the list of learning outcomes always use action verbs such as in the example below :* • *Set requirements* *In case of doubt on which verb to use you can revert to a powerpoint listing of a revised Bloom's taxonomy available in the STAFFER project Teams repository.*

Required Skills	*Which are, according to you, the skills which needs to be mastered before learning this one ?*
Follow-up Skills	*Which skills would, according to you, have this skill as a prerequisite?*
Content	*Always start with « Module 1 » then state the possible content of said module.* *Please note the module contents are to be global and not too specific in order to be applicable to all partners. By doing so each partner can adapt and develop this part on their side in order to fit their need.*
Educational Methods	
Assessment Methodologies	*Which , in your opinion, is/are the most relevant methodology/methodologies to assess if the trainee as acquired the skill or not*
ECTS Credits	
Recommended Duration	

This guideline copies the format of a skill recollection form. The explanations for the various contents are written in grey and italic next to the column it defines. For example, "short description" can be understood as "In a few words, describe what this skill is about". As mentioned in a previous chapter, learning objectives are to be written using action verbs. If in doubt, revert to a revised Bloom's taxonomy, which will be included as an appendix to this report.

3.5 Results

Through all these different tools, we can now state:

- Three occupational profiles selected by task 2.2
    - Train Driver
    - Staff in control centres
    - Infrastructure and maintenance (including engineering profiles)
- Five basic skill trends from task 3.2
    - Lifecycle management
    - Holistic system approach
    - Bridging of traditional and digital approaches
    - Collaboration
    - Problem Solving
- Eight skill recollection form completed through task 4.2
    - Use of BIM in the different phases of a project (life cycle)
    - Understanding fixed and variable costs
    - Establishing project structure
    - Technique & Technology in Transport and Connections
    - Railway operation
    - Methods of Railway Operation - Prognosing and Regulating
    - High-Speed Railway Transport
    - Railway Transport Infrastructure

Please note the recollection form will be enclosed as appendixes to this report.

4 POST-DEPLOYMENT ANALYSIS

4.1 Challenges & opportunities

As any project of this scale STAFFER, and in this case task 4.2, was rich in challenges as well as opportunities. Since the identification of qualification standards is closing it seems timely to share experiences on what went well and what could have been handled more efficiently.

4.1.1 Main challenges

The first challenge for the completion of this task in due time has already been mentioned in this very report and was discussed at-length with all 4.2 stakeholders. As task 4.2 revealed to be dependent on inputs from both task 2.2 as well as task 3.2, the identification of qualification standards would have been better-suited starting month 13. In order for this phase to work in the current timeframe, huge coordination efforts were made with DB, wmp consult and Siemens. Also, task 4.2 received inputs from these partners as soon as they could provide it within their own timeframe. However, as concomitant tasks, this left the identification of qualification standards little room to build a consistent set of skills. This issue clearly was the key challenge of task 4.2 within the STAFFER project.

To a lower extent, the definition of the perimeter revealed to be more challenging than initially anticipated. The question to answer was “how far should we go?” in the sense of the level of precision we wanted, as well as the number of skills we wanted to map. Decision on the scope of the task was taken based on various exchange inside and outside of task 4.2. As it was only six-month long the most relevant thing to do appeared to restrict the method to key skills and profiles identified by both task 2.2 and task 3.2.

4.1.2 Main opportunities

Though this step of the STAFFER project proved some difficulties, it was also rich with opportunities. Apart from the obvious aspect of increased collaboration with partners throughout Europe, task 4.2 could succeed thanks to two key elements: the implication of partners as well as the perceived centrality of this task.

As mentioned before in this report, due to the multiplicity of partners, not all participants share the same way of expressing training needs. The fact task 4.2 had to find a way to turn inputs from task 2.2 and task 3.2 into easy to use “skills” is prove of this difficulty. However, though from different perspectives, stakeholders involved in this phase of the project all shared a common perspective: ensuring STAFFER results can be beneficial not only for everyone involved

but also more globally for the rail sector in Europe. This common direction greatly facilitated exchanges. It is also an excellent news for tasks to come as partners share a common understanding of the relevance and importance of the STAFFER project.

Another key aspect that arose, as the identification of qualification was moving forward, is how central task 4.2 was for the work package 4. "Central" is here to be understood as deeply interconnected with past, current as well as future tasks, not only at work package level but also project-wise. This understanding of the numerous interactions needed for this task to succeed happened early in the phase. Thanks to this early realisation, we were able to put the emphasis on our need for inputs from previous work packages. In return, this allowed our partners from task 2.2 and 3.2 to deliver their inputs a bit ahead of schedule so that we could incorporate them in our deliverables.

4.2 Further project-relevant info

As previously mentioned in this report, the various tools created under this task are designed to be used by further steps of the STAFFER project. More specifically, the skill recollection form is to be used as is, using the filling guidelines.

On the other end, both the occupational profile database as well as the groups to skills recollection form are "living" tools. This means the form is to be incremented with other inputs than the ones currently listed. It also implies some minor aspects of this form might change to better suit incoming inputs on skillsets and/or skills. Regarding the database, the idea is to have it ready for other tasks to use as they see relevant.

4.3 Best practices

To conclude this report it seemed important to share good practices learned through experience in the identification of qualification standards. In a few words, what arose as truly critical was the need for a clear and regular communication. However, due to the number of stakeholders many agendas were conflicting. It was not always easy to bring everyone around the table, especially on routine meetings. What we would suggest for next tasks of the project to apply if they want to succeed in an efficient communication would be:

- Schedule meetings on the regular basis yet take into consideration "busy periods" (holidays, start of the semester for academic partners etc…)

- Leave room for eventual extra meetings with only a few stakeholders on a very specific topic

The right time to communicate is key, yet it is important not to forget the way to communicate. As we learn with our "broader circle" partners, it is always important to use the right channel to reach your stakeholders. This means you should always keep in mind that the communication culture of your stakeholder might greatly differ from your own. Losing this perspective will result in slower/inadequate answers.

The last key aspect that is important to take into consideration is always making sure all stakeholders share a common objective, even though it may be labelled differently from one partner to the next. This should not be a problem for the STAFFER project, as this dynamic of shared objectives is already in place and seems rooted in all partners' practice.

5 APPENDIX