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Annex 1 Analytical framework – labour market models

Background information for the study 'Analysis of the trends and prospects of jobs and working conditions in transport'

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1 Introduction

This is Annex 1 to the Analysis of the trends and prospects of jobs and working conditions in transport, commissioned by JRC and conducted by Panteia in cooperation with PwC Italy. The analytical framework that is applied in the study, comprises four interconnected labour market models: flow model, discrepancies model, PESTLE-analysis model and solutions model. It is presented in detail in this Annex 1. On the basis of this analytical framework the research questions to be answered in this study are formulated. This can be described as follows:

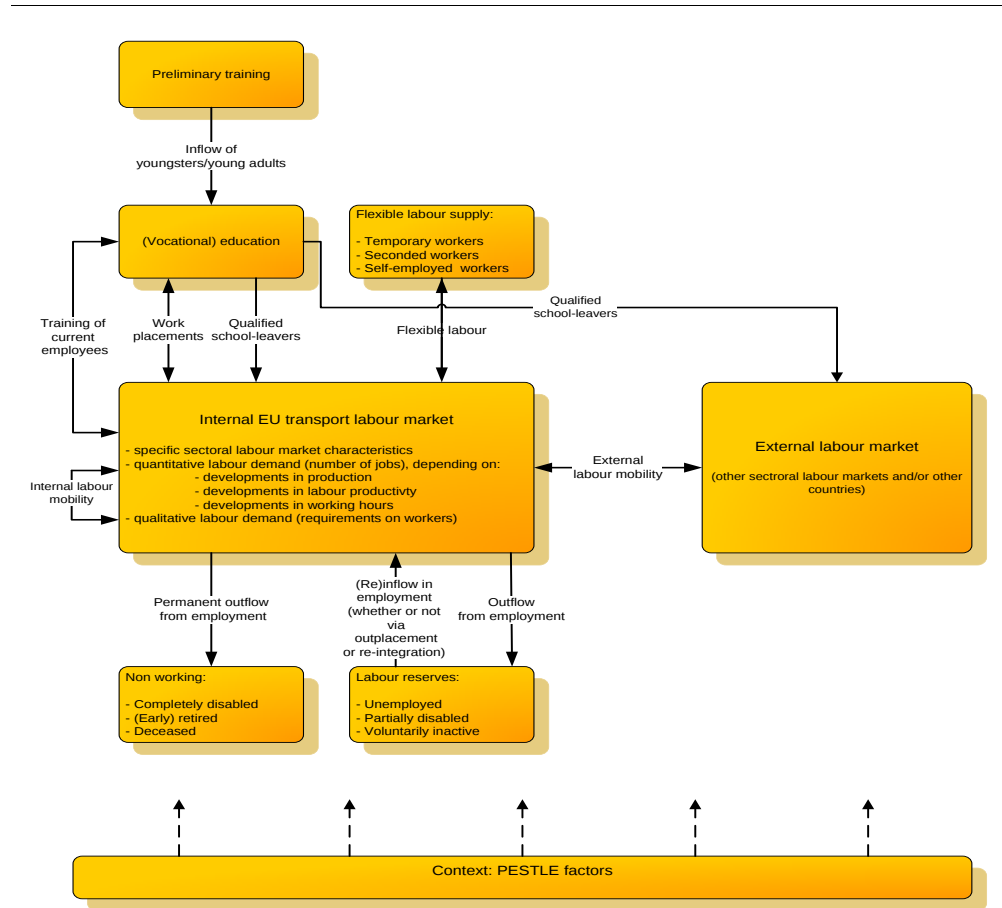
- The external factors influencing the development of the labour market can be identified by looking at six specific domains. The six dimensions are the political, economic, social, technological, legal and environmental dimension, together PESTLE. These six different dimensions can influence the situation on the transport labour market to a large extent, though some are obviously more important than others. The PESTLE-model provides, so to speak, a common language to describe the challenges faced by the different actors.
- The EU transport labour market has a demand side and a supply side.
- The demand for labour has a quantitative side (number of jobs) as well as a qualitative side (requirements on workers) and is being influenced by the specific (labour market) characteristics of the sector.
- Likewise, the supply of labour has a quantitative side (number of potential workers) as well as a qualitative side (characteristics of workers, e.g. competences).
- An ideal sectoral labour market knows completely balanced demand and supply. In the real world, however, this is mostly not the case: labour shortages and redundancies cause problems for market agents. Hence, at the centre of this analysis of the EU transport labour market is the discrepancies model: the EU transport labour market is analysed according to the three characteristics of market functioning: (1) quantitative discrepancies, (2) qualitative discrepancies and (3) problems with the transparency of the labour market due to information asymmetries.

The chapters in this Annex follow this structure, first the four labour market models are described in separate sections: flow model, discrepancies model, PESTLE-analysis model and solutions model. Chapter 6 links the research questions answered in this study to the analytical framework.

2 Flow model: working of the labour market

The working of the labour market is explained by 'the flow model' this describes schematically the linkages in the EU transport labour markets. In this way it offers insight in the working of the different sub-markets of the European labour market for transport.

Figure 2.1 Flow model: the working of the EU transport labour market



Source: Panteia

The EU transport labour market has a demand side and a supply side.

The **demand for labour** on the EU transport labour market consists of expansion demand and replacement demand:

- The expansion demand is the result of developments in production, labour productivity and working hours in the sector. Production (i.e. demand for goods/services) and productivity (i.e. the amount of goods/services that a worker produces in a given amount of time) determine the employment in terms of FTEs. The employment in terms of jobs is determined by the number of FTEs and the average working hours per employee (a lower average of working hours per employee means more jobs).

An improved productivity, if translated into lower prices, increases demand for the service and lowers the amount of labour needed to satisfy that demand. The relationship between the two forces will determine whether employment in that sector goes up or down. In any case a cheaper transport will increase employment in the economy as a whole which is also very important in an impartial assessment of a policy measure. A particular aspect to consider is automation which lowers the need for labour, but increases the need for the kind of skilled labour needed to manage the automated systems. Furthermore, productivity is also influenced by regulations on working conditions.

- The replacement demand is the result of:
 - External labour mobility from the EU transport labour market to other sectoral labour markets and/or other countries (inter-sectoral labour mobility respectively outgoing labour migration)
 - Outflow from employment to labour reserves (unemployment; partial disability; voluntary inactivity)
 - Permanent outflow from employment to a non-working status (complete disability; (early) retirement; decease).
- The demand for labour has a quantitative side (number of jobs) as well as a qualitative side (requirements on workers) and is being influenced by the specific (labour market) characteristics of the sector.

The **supply of labour** on the EU transport labour market roughly comprises:

- Internal mobility (intra-sectoral labour mobility: job changes within the EU transport labour market)
- Deployment of students on work placements
- Inflow of qualified school-leavers
- Training of current employees (upgrading)
- Flexible labour supply (temporary workers; seconded workers; self-employed workers and so on)
- External labour mobility from other sectors and/or other countries to the EU transport labour market (inter-sectoral labour mobility respectively incoming labour migration)
- (Re)inflow from labour reserves (unemployment; partial disability; voluntary inactiveness).

In an ideal labour market, the demand for and the supply of labour are completely in balance. In the real world, however, this is mostly not the case, which brings us to the second labour market model: the discrepancies model.

3 Discrepancies model: mismatch on the labour market

The key objective of labour market policy is to come to a balance between labour market demand and supply. If the demand cannot be satisfied, the potential of a sector is not realized. If there is too much supply, people will end up in unemployment or in unsuitable jobs. The search is however for a dynamic balance whereby potential changes and developments in the sector can be accommodated, creating a flexible but socially sustainable system.

Many sectors and countries are faced with discrepancies in their labour markets, that can be characterised as a mismatch between supply and demand. The labour market discrepancies can be of a quantitative or a qualitative nature. Also they can be created by a lack of transparency in the way the labour market is organized that may cause information asymmetries. Analysing demand and supply against one another can show where the discrepancies lie.

At the centre of the analysis of the EU transport labour market is the discrepancies model, see Figure 2.2. The 'panorama' on the EU transport labour market will be analysed according to the three characteristics of market functioning: (1) quantitative discrepancies, (2) qualitative discrepancies and (3) transparency of the labour market. The aim is to present the panorama for the current situation and the future scenarios.

Quantitative discrepancies occur when there are not enough sufficiently qualified school leavers or job seekers in a sector as a whole or where there are not enough vacancies to make use of the supply. Importantly, these aspects can influence on another. Thus in a labour market characterised by labour shortages, wages will often rise which in turn might attract more labour supply in the form of new school leavers who are attracted by the sector. In the case of transport it may be the case that in the long term a shortage of employees may lead to improved working conditions, including salary levels, although other adjustment processes are also possible. It may also lead to a higher presence of non-EU workers.

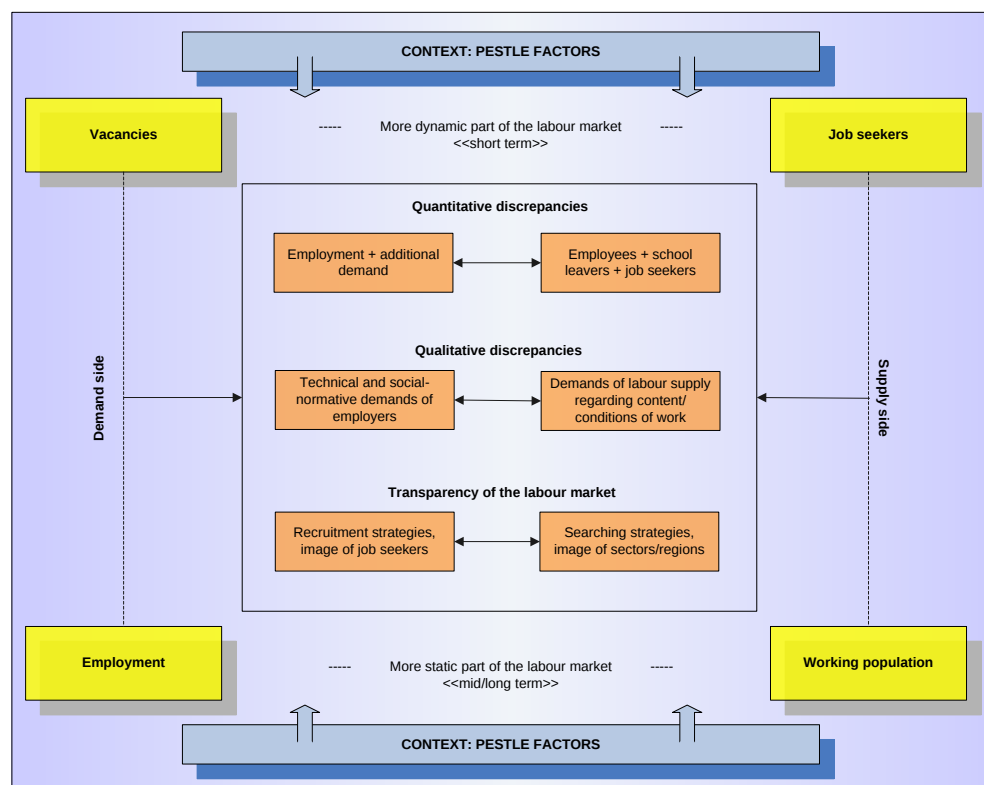
Qualitative discrepancies on the other hand occur where there is both sufficient supply of labour and a sufficient number of vacancies, but where the demands and wishes of employees and employers regarding level of qualification, content and organisation of the work diverge. It may be the case that there are simply not enough people who are qualified to do specific work. This may become the case for High Speed Train drivers. It may also be the case that school leavers prefer to work in other sectors of industry. Transport requires great flexibility of working hours and 24 hour availability, whereas employees are placing increasing emphasis on a strong balance between work and private life. The 24 hour availability is made possible by the use of shifts. For purposes of presentation, in the main text a distinction is made between:

- Qualitative discrepancies: competences
- Qualitative discrepancies: job quality

Thirdly, there is also the problem of information asymmetries related to the transparency of the labour market. In these cases, the demand and supply should actually be balanced, but employers and job seekers are unable to find to one another due to job search and recruitment strategies that do not respond to each other. This may also be induced by flawed images of the sector or of job seekers (or groups thereof) which prevent a better match of supply and demand.

Looking from the EU perspective, this problem is even more likely to occur than at the national level. In the case of transport, this can for example be the case when employers do not approach job seekers from other countries, immigrant groups or from other sectors. Potential matches are then missed and both the employer and the job seeker remain dissatisfied. Legal requirements can also play a role. Figure 3.1 presents the labour market discrepancies model.

Figure 3.1 Discrepancies model



Source: Panteia

4 PESTLE: factors influencing (mismatch on) the labour market

The flows as well as the discrepancies on the – current and future - EU transport labour market are influenced by external factors. There are several influential factors within the macro environment, which may pose challenges or create solutions for labour market management in the transport sector. A tool for identifying these factors is the PESTLE-analysis.¹

The external factors influencing the development of the labour market can be identified by looking at six specific domains. The six dimensions are the **p**olitical, **e**conomic, **s**ocial, **t**echnological, **l**egal and **e**nvironmental dimension. The PESTLE-analysis is originally a business-study model describing a framework of relevant factors on macro-context level.

It is mainly used for analysing the business environment of businesses to conduct external analyses of strengths and weaknesses of businesses and can help organisations in developing strategies. The PESTLE-analysis can also be used for a contextual analysis of (sectoral) labour markets – in this case the transport sector in Europe (EU-27).

The table below shows examples of what these dimensions can comprise.

<i>PESTLE factors</i>	<i>Examples of issues relevant to this study</i>
Political - Global, EU, national, regional, local and community trends, changes, events etc.	Changes in national transport policy, EU initiatives, distribution of influence between social partners and government, public private partnerships, financing issues connected to the sector, immigration policies regarding labour migrants etc.
Economic - Global, EU, national and local trends, changes, events etc.	Increasing international competition, emerging economies, economic crisis and its impact on national finances, restructuring as a result of economic development, shifts in relative costs of various modes, etc.
Social - Development in society – culture, behaviour, expectations, composition etc.	Demographic change and ageing of society, impacting both work force and client population, migration flows within EU and from third countries, social tensions etc
Technological : Developments: computer hardware, software, applications, other equipment, materials, products and processes etc.	New technologies, leading to new demands on skills, but also task or even business reallocation, etc.

¹ Panteia has been using the PESTLE-analysis in (sectoral) labour-market research for a long time. Some recent examples of sectoral labour-market studies in which we used this model are: Panteia, SEOR and Etil (2012). *Arbeid in Zorg en Welzijn 2013. Integrerend jaarrapport*; Panteia (2012). *Via kennis naar kunde. Samenwerking tussen hoger onderwijs en arbeidsmarkt in vier sectoren*; Panteia in commission of Eurofound (2013). *Creation and development of jobs in home care services*.

<i>PESTLE factors</i>	<i>Examples of issues relevant to this study</i>
Legal: Global, EU, National legislation changes, prospects etc	Deregulation of economy and labour market entry, internal market rules, labour law, changes in occupational health and safety legislation, changes in environmental protection legislation
Environmental: Global, EU, national, local issues; pressures, movements etc.	Increasing emphasis on sustainability throughout the economy, environmental legislation leading to stricter regulation in the handling of specific materials, increasing emphasis on local small-scale solutions in the context of energy efficiency

These six different dimensions influence the transport labour market to a large extent, though some are obviously more important than others. In the context of finding potential sources of human capital, especially the social and the economic dimensions are taken into account.

The labour market discrepancy model connected to the PESTLE factors helps to quickly identify problem areas in the EU and its member states. The model provides, so to speak, a common language to describe the challenges faced by the different actors. Given the rapid changes in the sector, it is expected that there are clear discrepancies to be found. Whether they are qualitative or quantitative, pertaining to a lack of influx into the sector or too great an outflow to be compensated, or whether they are triggered by developments in one of the PESTLE dimensions can all be swiftly recorded, facilitating at the same time a structured way of comparison.

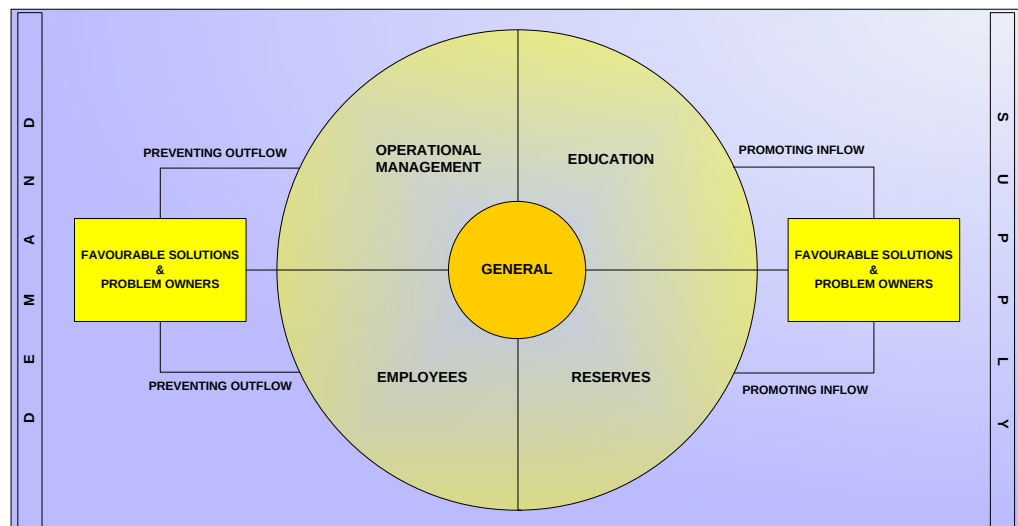
5 Solutions model: strategies to combat mismatch on the labour market

The PESTLE-analysis also provides a bridge connecting challenges to solutions (see the solutions model in figure 5.1). Importantly, a distinction can be made between a more dynamic part and a more static part of the labour market, namely the world of vacancies and job seekers and the world of the currently employed. Whereas vacancies and job seekers can be influenced more directly and in the short-term, it is important not to forget about issues and shifts in the working population in employment.

In the specific case tackled by this study this has to do on the one hand with strategies to retain and to upgrade present employees in the sector and prevent outflow, but also to look at strategies targeted at the labour force at large, for example by encouraging employees in shrinking sectors to consider a career in transport. Problems and discrepancies located in the static part of the labour market require different solutions than challenges originating in the dynamic part.

The solutions below are based on skills/labour shortages. A comparable approach can be used in case of redundancy.

Figure 5.1 Solutions model



Source: Panteia

The solutions model distinguishes the following strategies for reducing discrepancies on the EU transport labour market:

- 1 More **general solutions influencing the context** of the (transport) labour market
- 2 Promoting inflow:
 - **A. Targeting labour reserves** in order to attract new employees to the sector (including the recruitment of the unemployed and other groups currently not working in the transport sector, existing immigrant groups and labour migrants; attractiveness of working in the sector is an important issue in this context).
 - **B. Stimulating and facilitating education for potential employees** (among others the creation of new specific learning paths, of campaigns stimulating people to choose for an educational and occupational path in the sector and of an institutional improvement of the connection between labour market and education in general).
- 3 Preventing outflow/ diminishing labour demand:
 - **A. Improving the situation of current employees** in order to optimize their potential as well as prevent them from leaving the sector (for instance by the introduction of (re)training programs, professionalising the sector and providing more career perspectives for existing employees and improving the working conditions).
 - **B. Improving the operational management/ labour productivity** of organisations (for example through the use of new technologies, treatment methods etc. and/or (innovative) changes in functions and organisation).

6 Research questions

Based on the labour market models described above, this study poses two main questions:

- 1 What are the current and future affairs of the attractiveness of the European transport labour market and the adequacy of the supply of labour skills?**
- 2 What feasible and necessary possible solutions can be recommended to improve current and future circumstances in the European transport labour market?**

Whereas the first question is describing the current and future labour market of transport situation in terms of discrepancies, the second one is trying to give solutions/recommendations for the identified discrepancies on the EU transport labour market.

Ad 1. The first main question (What are the current and future affairs of the attractiveness of the European transport labour market and the adequacy of the supply of labour skills?) can be divided into several sub-questions. These sub-questions are linked to the different parts of the labour market discrepancy model: quantitative discrepancies, qualitative discrepancies and information asymmetries related to the transparency of the labour market. Within these three types of discrepancies research questions are assigned to demand for (employers' perspective) or supply of labour (employees' and job seekers' perspective).

Regarding possible *quantitative discrepancies* sub questions on the labour demand side (employers' perspective) to be answered, are:

- What is the current number of jobs in transport?
- What is the expected number of jobs in transport (additional demand)?

Regarding possible *quantitative discrepancies* sub questions on the labour supply side (employees' and job seekers' perspective) to be answered, are:

- What is the current number of employees in transport?
- What is the *expected* number of employees in transport (additional supply)?

Regarding possible *qualitative discrepancies* sub questions on the labour demand side (employers' perspective) to be answered, are:

- What are employers' requirements of skills and educational level of current employees (technical, social, normative)?
- What are the *expected* employers' requirements?
- What is the current level of job quality (in terms of employment- and work quality)?¹
- What is the *expected* level of job quality?

¹ From the employers' perspective job quality is an input towards the quality of the work done, from the perspective of the employees and job seekers job quality is part of the output in terms of quality of life.

Regarding possible *qualitative discrepancies* sub questions on the labour supply side (employees' and job seekers' perspective) to be answered, are:

- What are current employees' skills and educational level?
- What are school leavers'/job seekers' skills and educational level?
- What are the *expected* skills and educational level?
- What are employees' job quality demands (in terms of employment - and working quality)?
- What are school leavers/job seekers job quality demands?
- What are the *expected* job quality demands:

Regarding *information asymmetries related to the transparency of the labour market*, sub questions on the labour demand side (employers' perspective) to be answered, are:

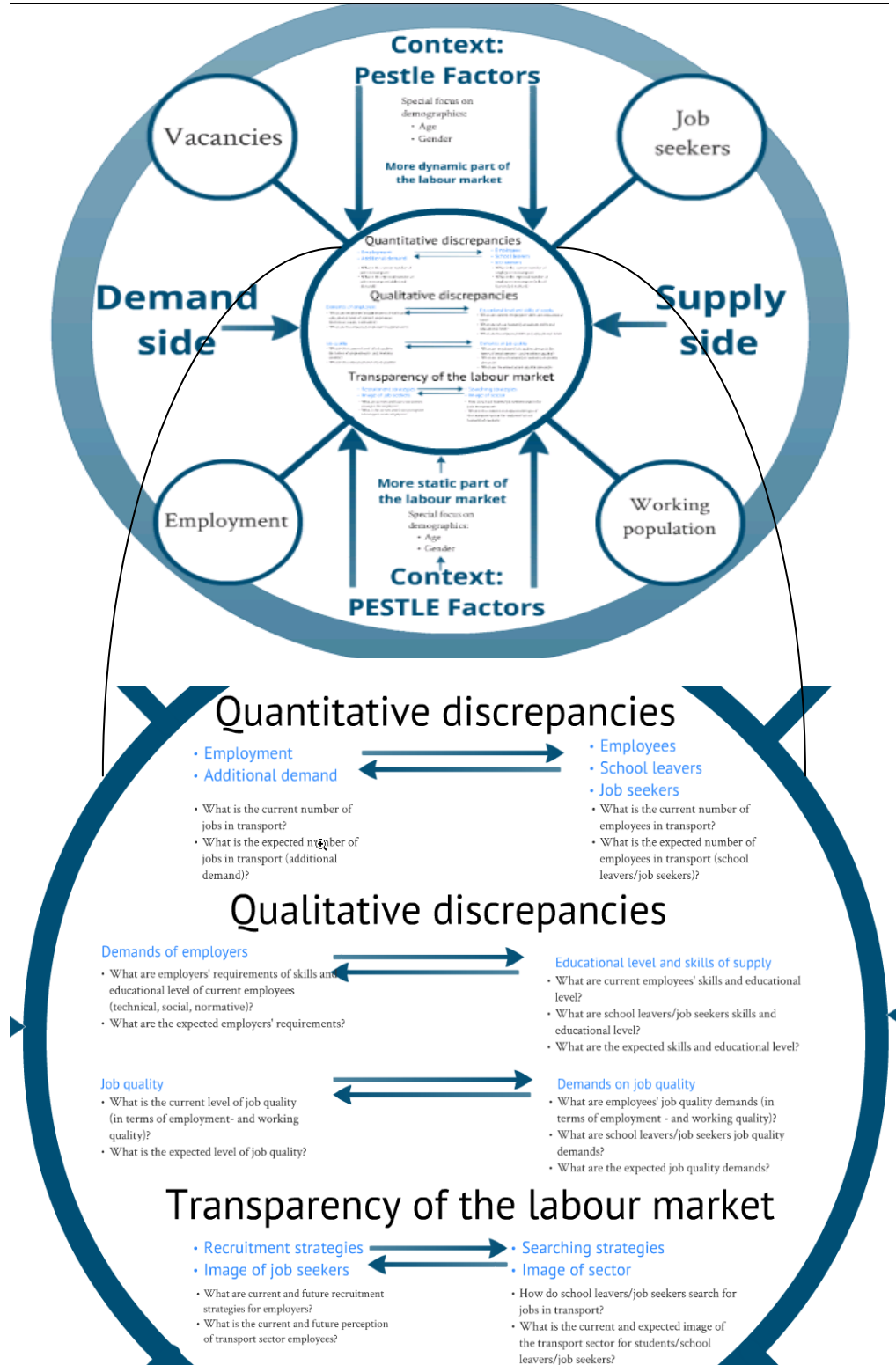
- What are the current and future recruitment strategies executed by employers?
- What is the transport sector's current perception of employees and how will this change in the future? (And is this perception backed by objective facts?)

Regarding *information asymmetries related to the transparency of the labour market* sub questions on the labour supply side (employees' and job seekers' perspective) to be answered, are:

- How do job seekers search for jobs in the transport sector now and in the future?
- How do current employees and job seekers perceive the transport sector in terms of image, and what will this image likely be in the future? (And is this perception backed by objective facts?)

Based on the dimensions of the labour market discrepancies model (and the influencing PESTLE factors) the research questions mentioned above have been incorporated in the model (see figure 6.1).

Figure 6.1 Research questions linked to discrepancies model



Source: Panteia, 2013

Ad 2. The second main question (What feasible and necessary measures can be recommended to improve current and future circumstances in the European transport labour market?) relates to the solutions model and can be divided into the following sub questions:

Recommendations for preventing outflow of employees

- What measures can be conceived that prevent the outflow of skilled employees from the European transport labour market?
- What types of recommendations are proposed to improve worker retention?
- What types of recommendations are proposed to enhance job quality?

Recommendations for promoting inflow of employees

- What measures can be identified that promote the inflow of skilled employees into the European transport labour market?
- What type of education and training can be employed to boost skilled worker numbers?
- Which reserves of employees can be tapped to increase skilled worker numbers?
- How can labour mobility be promoted within and between transport modes and professions, in particular when it implies cross-border mobility?