

# Modeling of information processes related to European funds by means of generalized nets

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**Abstract:** The paper presents the path to European funds by a generalized net. We are going to consider a scheme of strategic programme documents that clearly define the performance measures for financial assistance of beneficiaries in a transparent manner.

**Keywords:** Generalized net, Modeling, Project.

**AMS Classification:** 68Q85.

## 1 Introduction

Universal European practice is commercial banks to participate in the process of absorption of Structural Funds and Cohesion Fund of European Union, which provides prestige and complements the evaluation of the projects. As a major component of the financial market, the bank gives the candidate–beneficiary the opportunity to find a way to finance their projects. The banking experts operate professionally funds and have an established practice in the assessment of reliability, reality and the candidate’s financial capacity. The bank participation ensures the financial efficiency and security of the project, the reliability of the idea and realism of the forecast results. Inappropriate is the claim that the Bank participation in the developed projects simply reduces to credit provision. Experience shows that this is not just a bank loan but an individually prepared set of banking products and services which is necessary for realization of the project – special bank accounts, investment loan or credit line, Internet banking and others. At least it should be mentioned that the project financing is divided into co–financing (the percentage part that is funded by the beneficiary himself) and bridge financing (the financing of the entire project until the funds are received by the beneficiary at the end of project period), which determines various options for different credit products in the particular funding schemes. For the period 2007 – 2013, Bulgaria is able to absorb almost 7 billion from Operational Programmes (OPs). The Funds absorption is an essential element of assessment for state effectiveness. It will contribute to the achieving the object – to 2015. Bulgaria to be a competitive country – a member of the EU with a high standard of living, good income and social sensitivity. Of particular importance in this direction is the effect of the absorption of these funds as "fresh resources" for the Bulgarian economy.

## 2 Description of generalized net model with multiple transitions

The generalized net model (for GNs, see [1–4]) contains the following set of transitions:

$$A = \langle Z, Z_0, Z_1, Z_2, Z_3, Z_4, Z_5, Z_6, Z_7, Z_8, Z_9, Z_{10}, Z_{11}, Z_{12}, Z_{13}, Z_{14}, Z_{15} \rangle$$

These transitions describe the following processes:

- $Z$  – Beneficiary groups;
- $Z_0$  – Steps emerging ideas;
- $Z_1$  – OP "Competitiveness of Bulgarian Economy";
- $Z_2$  – OP "Regional Development";
- $Z_3$  – OP "Human Resources";
- $Z_4$  – OP "Administrative Capacity";
- $Z_5$  – OP "Technical Assistance";
- $Z_6$  – OP "Environment";
- $Z_7$  – OP "Transport";
- $Z_8$  – Beneficiary groups for the OP "Competitiveness of Bulgarian Economy";
- $Z_9$  – Beneficiary groups of OP "Regional Development";
- $Z_{10}$  – Beneficiary groups of the OP "Human Resources";
- $Z_{11}$  – Beneficiary groups of the OP "Administrative Capacity";
- $Z_{12}$  – Beneficiary groups of OP "Technical Assistance";
- $Z_{13}$  – Beneficiary groups of OP "Environment";
- $Z_{14}$  – Groups beneficiaries OP "Transport";
- $Z_{15}$  – OP;
- $Z_{16}$  – Managing Authority of OP "Competitiveness of Bulgarian Economy";
- $Z_{17}$  – Procedures for approval of projects under the OP "Competitiveness of Bulgarian Economy";
- $Z_{18}$  – Managing Authority of OP "Human Resources";
- $Z_{19}$  – Procedures for approval of projects under the OP "Human Resources";
- $Z_{20}$  – Managing Authority of OP "Regional Development";
- $Z_{21}$  – Procedures for approval of projects under OP "Regional Development";
- $Z_{22}$  – Managing Authority of Operational Programme "Administrative Capacity";
- $Z_{23}$  – Procedures for approval of projects under the OP "Administrative Capacity";
- $Z_{24}$  – Managing Authority of OP "Technical Assistance";
- $Z_{25}$  – Procedures for approving the project under OP "Technical Assistance";
- $Z_{26}$  – Managing Authority of OP "Environment";
- $Z_{27}$  – Procedures for approval of projects under OP "Environment";
- $Z_{28}$  – Managing Authority of OP "Transport";
- $Z_{29}$  – Procedures for approval of projects under OP "Transport";
- $Z_{30}$  – Parts of the procedures;

The tokens entering places have the following characteristics:

- $L_0$  – Phase of the OP "Competitiveness of Bulgarian Economy";

- L<sub>01</sub> – The stages of the project "Regional Development";
- L<sub>02</sub> – Phase of the OP "Human Resources";
- L<sub>03</sub> – Phase of the OP "Administrative Capacity";
- L<sub>04</sub> – Phase of the OP "Technical Assistance"
- L<sub>05</sub> – Phase of the OP "Environment";
- L<sub>06</sub> – Phase of the OP "Transport";
- L<sub>1</sub> – Development of economy based on knowledge and innovation;
- L<sub>2</sub> – Increasing efficiency of enterprises and promoting supportive business environment;
- L<sub>3</sub> – Financial redursi enterprise development;
- L<sub>4</sub> – Strengthening the international market positions of Bulgarian economy;
- L<sub>5</sub> – TA;
- L<sub>6</sub> – Sustainable and integrated urban development;
- L<sub>7</sub> – Regional and local accessibility;
- L<sub>8</sub> – Sustainable Tourism Development;
- L<sub>9</sub> – Regional and local networks, cooperation and capacity building;
- L<sub>10</sub> – Technical Assistance;
- L<sub>11</sub> – Encourage the creation of new jobs and growth in the labor market, inclusive;
- L<sub>12</sub> – Raising the productivity and adaptability of employees;
- L<sub>13</sub> – Improving the quality of education and training in accordance with the needs of the labor market to build an economy based on knowledge;
- L<sub>14</sub> – Improving access to education and training;
- L<sub>15</sub> – Social inclusion and promotion of social economy;
- L<sub>16</sub> – Increase the effectiveness of the institutions of the labor market, social and health services;
- L<sub>17</sub> – Transnational and inter regional cooperation;
- L<sub>18</sub> – Technical Assistance;
- L<sub>19</sub> – Improvement and development of infrastructure for water and wastewater in settlements with over 2000 PE;
- L<sub>20</sub> – Improvement and development infrastructure for waste treatment;
- L<sub>21</sub> – Conservation and restoration of biodiversity;
- L<sub>22</sub> – Technical Assistance;
- L<sub>23</sub> – Development: trans European railway infrastructure and major national transport axes;
- L<sub>24</sub> – Development of road infrastructure along the Trans–European and major national transport axes;
- L<sub>25</sub> – Improving: inter-modality for passengers and load;
- L<sub>26</sub> – Improvement of maritime and inland – spearing roads;
- L<sub>27</sub> – Good Governance;
- L<sub>28</sub> – Human Resource Management in the central and local administration, judiciary and civil society;
- L<sub>29</sub> – Quality administrative services and e–government development;

- L<sub>30</sub> – Support for the Implementation of the Central Coordination Unit, Certifying Authority, the audit authority and the Committee to monitor the NSRF (National Strategic Reference Framework);
- L<sub>31</sub> – In its further development and support for the functioning of information system management of the Structural Funds;
- L<sub>32</sub> – Dissemination of general information regarding structured instruments of the EU;
- L<sub>33</sub> – Introduction to the requirements under the program documentation for funding;
- L<sub>34</sub> – Plan preparation and distribution of activities in preparation of any part of the project;
- L<sub>35</sub> – Introduction to, Investment plans for future rounds of the applicant;
- L<sub>36</sub> – Justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- L<sub>37</sub> – Marketing Analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- L<sub>38</sub> – Financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- L<sub>39</sub> – Preparation of project budget for the period of performance;
- L<sub>40</sub> – Preparation of the project, according to the operation and application forms;
- L<sub>41</sub> – Application to the competent authority – the managing authority or intermediate body.
- L<sub>42</sub> – Approval of the project applied for OP "Competitiveness of Bulgarian Economy";
- L<sub>43</sub> – Disapproval of the project applied for OP "Competitiveness of Bulgarian Economy";
- L<sub>44</sub> – Financing of the project applied for OP "Competitiveness of Bulgarian Economy";
- L<sub>45</sub> – Approval of the project applied for OP "Regional Development";
- L<sub>46</sub> – Disapproval of the project applied for OP "Regional Development";
- L<sub>47</sub> – Financing of the project applied for OP "Regional Development";
- L<sub>48</sub> – Approval of the project applied for OP "Human Resources";
- L<sub>49</sub> – Disapproval of the project applied for OP "Human Resources";
- L<sub>50</sub> – Financing of the project applied for OP "Human Resources";
- L<sub>51</sub> – Approval of the project applied for OP "Administrative Capacity";
- L<sub>52</sub> – Disapproval of the project applied for OP "Administrative Capacity";
- L<sub>53</sub> – Financing of the project applied for OP "Administrative Capacity";
- L<sub>54</sub> – Approval of the project applied for OP "Technical Assistance"
- L<sub>55</sub> – Disapproval of the project applied for OP "Technical Assistance"
- L<sub>56</sub> – Financing of the project applied for OP "Technical Assistance"
- L<sub>57</sub> – Approval of the project applied for OP "Environment";
- L<sub>58</sub> – Disapproval of the project applied for OP "Environment";
- L<sub>59</sub> – Financing of the project applied for OP "Environment";
- L<sub>60</sub> – Approval of the project applied for OP "Transport";
- L<sub>61</sub> – Disapproval of the project applied for OP "Transport";
- L<sub>62</sub> – Financing of the project applied for OP "Transport";

- L<sub>63</sub> – Check–fulfillment of the beneficiaries under the OP "Competitiveness of Bulgarian Economy";
- L<sub>64</sub> – Check–implementation of the beneficiary under OP "Regional Development";
- L<sub>65</sub> – Check–implementation of the beneficiary under the OP "Human Resources";
- L<sub>66</sub> – Check–implementation of the beneficiary under the OP "Administrative Capacity";
- L<sub>67</sub> – Checking the performance of the beneficiary–OP "Technical Assistance"
- L<sub>68</sub> – Check–implementation of the beneficiary under OP "Environment";
- L<sub>69</sub> – Checking the performance of the beneficiary–OP "Transport";
- L<sub>70</sub> – When lawful execution, the beneficiary shall report to the Ministry of Economy and Energy;
- L<sub>71</sub> – When lawful execution, the beneficiary shall report to the Ministry of Regional Development and Public Works;
- L<sub>72</sub> – When lawful execution, the beneficiary shall report to the Ministry of Labour and Social Policy;
- L<sub>73</sub> – Lawful execution, the beneficiary shall report to the Ministry of Environment and Water;
- L<sub>74</sub> – When lawful execution, the beneficiary shall report to the Ministry of Transport;
- L<sub>75</sub> – When lawful execution, the beneficiary shall report to the Ministry of State Administration and Administrative Reform;
- L<sub>76</sub> – When lawful execution, the beneficiary shall report to the Ministry of Finance;
- L<sub>77</sub> – In wrongful execution, reimbursement and unfairness of holding the OP "Competitiveness of Bulgarian Economy";
- L<sub>78</sub> – In wrongful execution, reimbursement and unfairness of holding the "Regional Development";
- L<sub>79</sub> – In wrongful execution, reimbursement and unfairness of holding the OP "Human Resources";
- L<sub>80</sub> – In wrongful execution, reimbursement and unfairness of holding the OP "Administrative Capacity";
- L<sub>81</sub> – In wrongful execution, reimbursement and unfairness of holding the OP "Technical Assistance"
- L<sub>82</sub> – In wrongful execution, reimbursement and unfairness of holding the OP "Environment";
- L<sub>83</sub> – In wrongful execution, reimbursement and unfairness of holding the OP "Transport";
- L<sub>84</sub> – Implementation of projects; Potential beneficiaries LA–OP "Competitiveness of Bulgarian Economy";
- L<sub>A1</sub> – Small and Medium Enterprises (SMEs);
- L<sub>A2</sub> – Large enterprises;
- L<sub>A3</sub> – Researchers or research institutes, universities;
- L<sub>A4</sub> – Organizations operating as guarantee funds, micro–credit funds or equity funds investing in SMEs;
- L<sub>A5</sub> – Public and private organizations working in the field of standardization, certification and testing.

- L<sub>B</sub> – Presentation of the Project Managing Authority of OP "Competitiveness of Bulgarian Economy";
- L<sub>B1</sub> – "European Funds for Competitiveness";
- L<sub>B2</sub> – Ministry of Economy and Energy;
- L<sub>B3</sub> – Executive Agency for Promotion of Small and medium-sized enterprises;
- L<sub>C</sub> – Potential beneficiaries of OP "Regional Development";
- L<sub>C1</sub> – Municipalities, businesses with municipal participation, associations of municipalities, NGOs represented in local government;
- L<sub>D</sub> – Presentation of the Project Managing Authority of OP "Regional Development";
- L<sub>D1</sub> – General "Programming of Regional Development";
- L<sub>D2</sub> – Ministry of Regional Development and Public Works;
- L<sub>D3</sub> – regional departments of the Directorate in the six planning regions;
- L<sub>E</sub> – Potential beneficiaries of the "Human Resources";
- L<sub>E1</sub> – Educational, training and research institutions, vocational training centers;
- L<sub>E2</sub> – Non-governmental organizations (NGOs), academic organizations, institutions of the labor market at national and regional level, consulting firms;
- L<sub>E3</sub> – Socio-economic partners;
- L<sub>E4</sub> – Branch organizations;
- L<sub>E5</sub> – Employers;
- L<sub>E6</sub> – Research centers;
- L<sub>E7</sub> – Municipalities
- L<sub>E8</sub> – Sports clubs and youth organizations;
- L<sub>E9</sub> – Community Centers;
- L<sub>F</sub> – Presentation of the Project Managing Authority of OP "Human Resources";
- L<sub>F1</sub> – "European Funds, International Programmes and Projects";
- L<sub>F2</sub> – Ministry of Labour and Social Policy;
- L<sub>F3</sub> – "Coordination of education and international projects and programs";
- L<sub>F4</sub> – Ministry of Education and Science;
- L<sub>F5</sub> – Employment Agency and the Agency for Social Assistance;
- L<sub>G</sub> – Potential beneficiaries of Operational Programme "Administrative Capacity";
- L<sub>G1</sub> – Municipal administrations
- L<sub>G2</sub> – Municipal companies;
- L<sub>G3</sub> – Regional associations;
- L<sub>G4</sub> – Associations of municipalities;
- L<sub>G5</sub> – Public water companies;
- L<sub>H</sub> – Presentation of the Project Managing Authority of Operational Programme "Administrative Capacity";
- L<sub>H1</sub> – Directorate "Cohesion Policy for Environment";
- L<sub>H2</sub> – Ministry of Environment and Water;
- L<sub>H3</sub> – Directorate "EU Funds for Environment";
- L<sub>H4</sub> – Ministry of Environment and Water;
- L<sub>H5</sub> – Directorate "ISPA Implementing Agency, Public Works and Water Systems";

- L<sub>H6</sub> – Ministry of Regional Development and Public Works;
- L<sub>I</sub> – Potential beneficiaries of OP "Technical Assistance"
- L<sub>I1</sub> – Municipalities;
- L<sub>I2</sub> – National Company "Railway Infrastructure";
- L<sub>I3</sub> – Fund "Road Infrastructure";
- L<sub>I4</sub> – Executive Agency for Exploration and Maintenance of the Danube ";
- L<sub>I5</sub> – Executive Agency "Maritime Administration";
- L<sub>J</sub> – Presentation of the Project Managing Authority of OP "Technical Assistance"
- L<sub>J1</sub> – "Coordination of Programmes and Projects";
- L<sub>J2</sub> – Ministry of Transport;
- L<sub>J3</sub> – Executive Agency "Roads";
- L<sub>J4</sub> – Executive Agency "Maritime Administration";
- L<sub>J5</sub> – National Company "Railway Infrastructure";
- L<sub>K</sub> – Potential beneficiaries of OP "Environment";
- L<sub>K1</sub> – Structures of public administration at all levels;
- L<sub>K2</sub> – Bodies of the judiciary;
- L<sub>K3</sub> – Structures of civil society;
- L<sub>L</sub> – Presentation of the Project Managing Authority of OP "Environment";
- L<sub>L1</sub> – "Management of projects and programs";
- L<sub>L2</sub> – Ministry of State Administration and Administrative Reform;
- L<sub>L3</sub> – Directorate "European coordination and international cooperation";
- L<sub>L4</sub> – Ministry of State Administration and Administrative Reform;
- L<sub>M</sub> – Eligible for OP "Transport";
- L<sub>M1</sub> – Ministry of Finance – Central Coordination Unit;
- L<sub>M2</sub> – Certifying Authority;
- L<sub>M3</sub> – Audit Authority;
- L<sub>M4</sub> – Managing Authority of OP "Technical Assistance"
- L<sub>M5</sub> – Units to support the dissemination of information for structural instruments at regional and local level;
- L<sub>N</sub> – Presentation of the Project Managing Authority of OP "Transport";
- L<sub>N1</sub> – "Management of EU Funds";
- L<sub>N2</sub> – Ministry of Finance (MoF);
- L<sub>O</sub> – Applying a "small project";
- L<sub>P</sub> – Application for a "major project";
- L<sub>Q</sub> – Applying for OP "Competitiveness of Bulgarian Economy";
- L<sub>R</sub> – Application OP "Regional Development";
- L<sub>S</sub> – Apply OP "Human Resources";
- L<sub>T</sub> – Application in OP "Administrative Capacity";
- L<sub>U</sub> – Application OP "Technical Assistance"
- L<sub>V</sub> – Applying for OP "Environment";
- L<sub>W</sub> – Applying for OP "Transport";
- L<sub>Z</sub> – Beneficiaries.

## Description of the transitions

Transition Z describing groups of beneficiaries is as follows:

$$Z = \langle \{L_Z\}, \{L_A, L_C, L_E, L_G, L_I, L_K, L_M\}, r_1 \rangle$$

where:

$r_1$	$L_A$	$L_C$	$L_E$	$L_G$	$L_I$	$L_K$	$L_M$
$L_Z$	$W_{Z,A}$	$W_{Z,C}$	$W_{Z,E}$	$W_{Z,G}$	$W_{Z,I}$	$W_{Z,K}$	$W_{Z,M}$

- $W_{Z,A}$  – Potential beneficiaries wishing to participate for the OP "Competitiveness of Bulgarian Economy";
- $W_{Z,C}$  – Potential beneficiaries wishing to participate OP "Regional Development";
- $W_{Z,E}$  – Potential beneficiaries wishing to participate for the OP "Human Resources";
- $W_{Z,G}$  – Potential beneficiaries wishing to participate for the OP "Administrative Capacity";
- $W_{Z,I}$  – Potential beneficiaries wishing to participate OP "Technical Assistance"
- $W_{Z,K}$  – Potential beneficiaries wishing to participate for OP "Environment";
- $W_{Z,M}$  – Potential beneficiaries wishing to participate OP "Transport";

Transition  $Z_0$  describing emerging ideas is as follows:

$$Z_0 = \langle \{L_0, L_{01}, L_{02}, L_{03}, L_{04}, L_{05}, L_{06}, L_{43}, L_{49}, L_{46}, L_{52}, L_{55}, L_{58}, L_{61}\}, \{L_{33}, L_{34}, L_{35}, L_{36}, L_{37}, L_{38}, L_{39}, L_{40}, L_{41}\}, r_2 \rangle$$

where:

$r_2$	$L_{33}$	$L_{34}$	$L_{35}$	$L_{36}$	$L_{37}$	$L_{38}$	$L_{39}$	$L_{40}$	$L_{41}$
$L_0$	$W_{0,33}$	$W_{0,34}$	$W_{0,35}$	$W_{0,36}$	$W_{0,37}$	$W_{0,38}$	$W_{0,39}$	$W_{0,40}$	$W_{0,41}$
$L_{01}$	$W_{01,33}$	$W_{01,34}$	$W_{01,35}$	$W_{01,36}$	$W_{01,37}$	$W_{01,38}$	$W_{01,39}$	$W_{01,40}$	$W_{01,41}$
$L_{02}$	$W_{02,33}$	$W_{02,34}$	$W_{02,35}$	$W_{02,36}$	$W_{02,37}$	$W_{02,38}$	$W_{02,39}$	$W_{02,40}$	$W_{02,41}$
$L_{03}$	$W_{03,33}$	$W_{03,34}$	$W_{03,35}$	$W_{03,36}$	$W_{03,37}$	$W_{03,38}$	$W_{03,39}$	$W_{03,40}$	$W_{03,41}$
$L_{04}$	$W_{04,33}$	$W_{04,34}$	$W_{04,35}$	$W_{04,36}$	$W_{04,37}$	$W_{04,38}$	$W_{04,39}$	$W_{04,40}$	$W_{04,41}$
$L_{05}$	$W_{05,33}$	$W_{05,34}$	$W_{05,35}$	$W_{05,36}$	$W_{05,37}$	$W_{05,38}$	$W_{05,39}$	$W_{05,40}$	$W_{05,41}$
$L_{06}$	$W_{06,33}$	$W_{06,34}$	$W_{06,35}$	$W_{06,36}$	$W_{06,37}$	$W_{06,38}$	$W_{06,39}$	$W_{06,40}$	$W_{06,41}$
$L_{43}$	$W_{43,33}$	$W_{43,34}$	$W_{43,35}$	$W_{43,36}$	$W_{43,37}$	$W_{43,38}$	$W_{43,39}$	$W_{43,40}$	$W_{43,41}$
$L_{49}$	$W_{49,33}$	$W_{49,34}$	$W_{49,35}$	$W_{49,36}$	$W_{49,37}$	$W_{49,38}$	$W_{49,39}$	$W_{49,40}$	$W_{49,41}$
$L_{46}$	$W_{46,33}$	$W_{46,34}$	$W_{46,35}$	$W_{46,36}$	$W_{46,37}$	$W_{46,38}$	$W_{46,39}$	$W_{46,40}$	$W_{46,41}$
$L_{52}$	$W_{52,33}$	$W_{52,34}$	$W_{52,35}$	$W_{52,36}$	$W_{52,37}$	$W_{52,38}$	$W_{52,39}$	$W_{52,40}$	$W_{52,41}$
$L_{55}$	$W_{55,33}$	$W_{55,34}$	$W_{55,35}$	$W_{55,36}$	$W_{55,37}$	$W_{55,38}$	$W_{55,39}$	$W_{55,40}$	$W_{55,41}$
$L_{58}$	$W_{58,33}$	$W_{58,34}$	$W_{58,35}$	$W_{58,36}$	$W_{58,37}$	$W_{58,38}$	$W_{58,39}$	$W_{58,40}$	$W_{58,41}$
$L_{61}$	$W_{61,33}$	$W_{61,34}$	$W_{61,35}$	$W_{61,36}$	$W_{61,37}$	$W_{61,38}$	$W_{61,39}$	$W_{61,40}$	$W_{61,41}$

- $W_{0,33}$  – Phase of the OP "Competitiveness of Bulgarian Economy" and familiarization with the requirements in the documentation of program funding;
- $W_{01,33}$  – Phase of the OP "Regional Development" and familiarization with the requirements in the documentation of program funding;

- W<sub>02, 33</sub> – Phase of the OP "Human Resources" and introduction to the requirements in the documentation of program funding;
- W<sub>03, 33</sub> – Phase of the OP "Administrative Capacity" and familiarization with the requirements in the documentation of program funding;
- W<sub>04, 33</sub> – Phase of the OP "Technical Assistance" and familiarization with the requirements in the documentation of program funding;
- W<sub>05, 33</sub> – Phase of the OP "Environment" and familiarization with the requirements in the documentation of program funding;
- W<sub>06, 33</sub> – Phase of the OP "Transport" and familiarization with the requirements in the documentation of program funding;
- W<sub>43, 33</sub> – Disapproval of the project applied for OP "Competitiveness of Bulgarian Economy" as documentation of program funding;
- W<sub>49, 33</sub> – Disapproval of the project applied for OP "Human Resources" as documentation of program funding;
- W<sub>46, 33</sub> – Disapproval of the project applied for OP "Regional Development" as documentation of program funding;
- W<sub>52, 33</sub> – Disapproval of the project applied for OP "Administrative Capacity" as documentation of program funding;
- W<sub>55, 33</sub> – Disapproval of the project applied for OP "Technical Assistance" as documentation of program funding;
- W<sub>58, 33</sub> – Disapproval of the project applied for OP "Environment" documentation in accordance with program funding;
- W<sub>61, 33</sub> – Disapproval of the project applied for OP "Transport" as documentation of program funding;
- W<sub>0, 34</sub> – Phase of the OP "Competitiveness of Bulgarian Economy" and preparation of plan and activities for preparation of any part of the project;
- W<sub>01, 34</sub> – Phase of the OP "Regional Development" and preparation of plan and activities for preparation of any part of the project;
- W<sub>02, 34</sub> – Phase of the OP "Human Resources" and preparation of plan and activities for preparation of any part of the project;
- W<sub>03, 34</sub> – Phase of the OP "Administrative Capacity" and preparation of plan and activities for preparation of any part of the project;
- W<sub>04, 34</sub> – Phase of the OP "Technical Assistance" and preparation of plan and activities for preparation of any part of the project;
- W<sub>05, 34</sub> – Phase of the OP "Environment" and preparation of plan and activities for preparation of any part of the project;
- W<sub>06, 34</sub> – Phase of the OP "Transport" and preparation of plan and activities for preparation of any part of the project;
- W<sub>43, 34</sub> – Disapproval of the project applied for OP "Competitiveness of Bulgarian Economy" and re-drafting of plan and activities for preparation of any part of the project;
- W<sub>49, 34</sub> – Disapproval of the project applied for OP "Human Resources" and re-drafting of plan and activities for preparation of any part of the project;

- W<sub>46, 34</sub> – Disapproval of the project applied for OP "Regional Development" and again making plan and activities for preparation of any part of the project;
- W<sub>52, 34</sub> – Disapproval of the project applied for OP "Administrative Capacity" and re-drafting of plan and activities for preparation of any part of the project;
- W<sub>55, 34</sub> – Disapproval of the project applied for OP "Technical Assistance" and re-drafting of plan and activities for preparation of any part of the project;
- W<sub>58, 34</sub> – Disapproval of the project applied for OP "Environment" and re-drafting of plan and activities for preparation of any part of the project;
- W<sub>61, 34</sub> – Disapproval of the project applied for OP "Transport" and re-drafting of plan and activities for preparation of any part of the project;
- W<sub>0, 35</sub> – Phase of the OP "Competitiveness of Bulgarian Economy" and awareness activities, Investment plans for future rounds of the applicant;
- W<sub>01, 35</sub> – Phase of the OP "Regional Development" and awareness activities, Investment plans for future rounds of the applicant;
- W<sub>02, 35</sub> – Phase of the OP "Human Resources" and introduction to business, Investment plans for future rounds of the applicant;
- W<sub>03, 35</sub> – Phase of the OP "Administrative Capacity" and awareness activities, Investment plans for future rounds of the applicant;
- W<sub>04, 35</sub> – Phase of the OP "Technical Assistance" and awareness activities, Investment plans for future rounds of the applicant;
- W<sub>05, 35</sub> – Phase of the OP "Environment" and awareness activities, Investment plans for future rounds of the applicant;
- W<sub>06, 35</sub> – Phase of the OP "Transport" and awareness activities, Investment plans for future rounds of the applicant;
- W<sub>43, 35</sub> – Disapproval of the project applied for OP "Competitiveness of Bulgarian Economy" and again reviewing the activity, Investment plans for future rounds of the applicant;
- W<sub>49, 35</sub> – Disapproval of the project applied for OP "Human Resources" and re-familiarization with the activity, Investment plans for future rounds of the applicant;
- W<sub>46, 35</sub> – Disapproval of the project applied for OP "Regional Development" and again reviewing the activity, Investment plans for future rounds of the applicant;
- W<sub>52, 35</sub> – Disapproval of the project applied for OP "Administrative Capacity" and re-familiarization with the activity, Investment plans for future rounds of the applicant;
- W<sub>55, 35</sub> – Disapproval of the project applied for OP "Technical Assistance" and again reviewing the activity, Investment plans for future rounds of the applicant;
- W<sub>58, 35</sub> – Disapproval of the project applied for OP "Environment" and again reviewing the activity, Investment plans for future rounds of the applicant;
- W<sub>61, 35</sub> – Disapproval of the project applied for OP "Transport" and re-familiarization with the activity, Investment plans for future rounds of the applicant;
- W<sub>0, 36</sub> – Phase of the OP "Competitiveness of Bulgarian Economy" and justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);

- W<sub>01, 36</sub> – Phase of the OP "Regional Development" and justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>02, 36</sub> – Phase of the OP "Human Resources" and justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>03, 36</sub> – Phase of the OP "Administrative Capacity" and justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>04, 36</sub> – Phase of the OP "Technical Assistance" and justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>05, 36</sub> – Phase of the OP "Environment" and justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>06, 36</sub> – Phase of the OP "Transport" and justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>43, 36</sub> – Disapproval of the project applied for OP "Competitiveness of Bulgarian Economy" and re-justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>49, 36</sub> – Disapproval of the project applied for OP "Human Resources" and re-justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>46, 36</sub> – Disapproval of the project applied for OP "Regional Development" and re-justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>52, 36</sub> – Disapproval of the project applied for OP "Administrative Capacity" and re-justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>55, 36</sub> – Disapproval of the project applied for OP "Technical Assistance" and re-justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>58, 36</sub> – Disapproval of the project applied for OP "Environment" and re-justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>61, 36</sub> – Disapproval of the project applied for OP "Transport" and re-justification of the need for investment and expected outcomes of implementation of the project idea (macro and micro level);
- W<sub>0, 37</sub> – Phase of the OP "Competitiveness of Bulgarian Economy" and marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>01, 37</sub> – Phase of the OP "Regional Development" and marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;

- W<sub>02, 37</sub> – Phase of the OP "Human Resources" and marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>03, 37</sub> – Phase of the OP "Administrative Capacity" and marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>04, 37</sub> – Phase of the OP "Technical Assistance" and marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>05, 37</sub> – Phase of the OP "Environment" and marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>06, 37</sub> – Phase of the OP "Transport" and marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>43, 37</sub> – Disapproval of the project applied for OP "Competitiveness of Bulgarian Economy" and re-marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>49, 37</sub> – Disapproval of the project applied for OP "Human Resources" and re-marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>46, 37</sub> – Disapproval of the project applied for OP "Regional Development" and re-marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>52, 37</sub> – Disapproval of the project applied for OP "Administrative Capacity" and re-marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>55, 37</sub> – Disapproval of the project applied for OP "Technical Assistance" and re-marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>58, 37</sub> – Disapproval of the project applied for OP "Environment" and re-marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>61, 37</sub> – Disapproval of the project applied for OP "Transport" and re-marketing analysis – compiling information on markets, market share, turnover, product groups and services revenues; study of the target group;
- W<sub>0, 38</sub> – Phase of the OP "Competitiveness of the Bulgarian economy" and financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- W<sub>01, 38</sub> – Phase of the OP "Regional Development" and financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);

- W<sub>02, 38</sub> – Phase of the OP "Human Resources" and financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- W<sub>03, 38</sub> – Phase of the OP "Administrative Capacity" and financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- W<sub>04, 38</sub> – Phase of the OP "Technical Assistance" and financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- W<sub>05, 38</sub> – Phase of the OP "Environment" and financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- W<sub>06, 38</sub> – Phase of the OP "Transport" and financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- W<sub>43, 38</sub> – Disapproval of the project applied for OP "Competitiveness of Bulgarian Economy" and again financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- W<sub>49, 38</sub> – Disapproval of the project applied for OP "Human Resources" and again, financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- W<sub>46, 38</sub> – Disapproval of the project applied for OP "Regional Development" and again, financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- W<sub>52, 38</sub> – Disapproval of the project applied for OP "Administrative Capacity" and again, financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- W<sub>55, 38</sub> – Disapproval of the project applied for OP "Technical Assistance" and again, financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- W<sub>58, 38</sub> – Disapproval of the project applied for OP "Environment" and again, financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);
- W<sub>61, 38</sub> – Disapproval of the project applied for OP "Transport" and again, financial analysis – analysis of financial condition of applicants for last years projected financial performance and development expectations (justified on the basis of information collected);

- W<sub>0, 39</sub> – Phase of the OP "Competitiveness of Bulgarian Economy" and preparation of project budget for the period of performance;
- W<sub>01, 39</sub> – Phase of the OP "Regional Development" and preparation of project budget for the period of performance;
- W<sub>02, 39</sub> – Phase of the OP "Human Resources" and preparation of project budget for the period of performance;
- W<sub>03, 39</sub> – Phase of the OP "Administrative Capacity" and preparation of project budget for the period of performance;
- W<sub>04, 39</sub> – Phase of the OP "Technical Assistance" and preparation of project budget for the period of performance;
- W<sub>05, 39</sub> – Phase of the OP "Environment" and preparation of project budget for the period of performance;
- W<sub>06, 39</sub> – Phase of the OP "Transport" and preparation of project budget for the period of performance;
- W<sub>43, 39</sub> – Disapproval of the project applied for OP "Competitiveness of Bulgarian Economy" and re-training budget for the project execution time;
- W<sub>49, 39</sub> – Disapproval of the project applied for OP "Human Resources" and re-training budget for the project execution time;
- W<sub>46, 39</sub> – Disapproval of the project applied for OP "Regional Development" and again
- W<sub>52, 39</sub> – Disapproval of the project applied for OP "Administrative Capacity" and re-training budget for the project execution time;
- W<sub>55, 39</sub> – Disapproval of the project applied for OP "Technical Assistance" and re-training budget for the project execution time;
- W<sub>58, 39</sub> – Disapproval of the project applied for OP "Environment" and re-training budget for the project execution time;
- W<sub>61, 39</sub> – Disapproval of the project applied for OP "Transport" and re-training budget for the project execution time;
- W<sub>0, 40</sub> – Phase of the OP "Competitiveness of Bulgarian Economy" and preparing the project, according to the operation and application forms;
- W<sub>01, 40</sub> – Phase of the OP "Regional Development" and preparing the project, according to the operation and application forms;
- W<sub>02, 40</sub> – Phase of the OP "Human Resources" and preparing the project, according to the operation and application forms;
- W<sub>03, 40</sub> – Phase of the OP "Administrative Capacity" and preparing the project, according to the operation and application forms;
- W<sub>04, 40</sub> – Phase of the OP "Technical Assistance" and preparing the project, according to the operation and application forms;
- W<sub>05, 40</sub> – Phase of the OP "Environment" and preparing the project, according to the operation and application forms;
- W<sub>06, 40</sub> – Phase of the OP "Transport" and preparing the project, according to the operation and application forms;

- W<sub>43, 40</sub> – Disapproval of the project applied for OP "Competitiveness of Bulgarian Economy" and re-training project in accordance with the requirements of the operation and application forms;
- W<sub>49, 40</sub> – Disapproval of the project applied for OP "Human Resources" and re-training project in accordance with the requirements of the operation and application forms;
- W<sub>46, 40</sub> – Disapproval of the project applied for OP "Regional Development" and again the project preparation, according to the operation and application forms;
- W<sub>52, 40</sub> – Disapproval of the project applied for OP "Administrative Capacity" and re-training project in accordance with the requirements of the operation and application forms;
- W<sub>55, 40</sub> – Disapproval of the project applied for OP "Technical Assistance" and re-training project in accordance with the requirements of the operation and application forms;
- W<sub>58, 40</sub> – Disapproval of the project applied for OP "Environment" and re-training project in accordance with the requirements of the operation and application forms; W<sub>61, 40</sub> – Disapproval of the project applied for OP "Transport" and re-training project in accordance with the requirements of the operation and application forms;
- W<sub>0, 41</sub> – Phase of the OP "Competitiveness of Bulgarian Economy" and apply to the competent authority – the managing authority or intermediate body.
- W<sub>01, 41</sub> – Phase of the OP "Regional Development" and applying to the competent authority – the managing authority or intermediate body.
- W<sub>02, 41</sub> – Phase of the OP "Human Resources" and apply to the competent authority – the managing authority or intermediate body.
- W<sub>03, 41</sub> – Phase of the OP "Administrative Capacity" and apply to the competent authority – the managing authority or intermediate body.
- W<sub>04, 41</sub> – Phase of the OP "Technical Assistance" and apply to the competent authority – the managing authority or intermediate body.
- W<sub>05, 41</sub> – Phase of the OP "Environment" and apply to the competent authority – the managing authority or intermediate body.
- W<sub>06, 41</sub> – Phase of the OP "Transport" and apply to the competent authority – the managing authority or intermediate body.
- W<sub>43, 41</sub> – Disapproval of the project applied for OP "Competitiveness of Bulgarian Economy" and re-apply to the competent authority – the managing authority or intermediate body.
- W<sub>49, 41</sub> – Disapproval of the project applied for OP "Human Resources" and re-apply to the competent authority – the managing authority or intermediate body.
- W<sub>46, 41</sub> – Disapproval of the project applied for OP "Regional Development" and again apply to the competent authority – the managing authority or intermediate body.
- W<sub>52, 41</sub> – Disapproval of the project applied for OP "Administrative Capacity" and re-apply to the competent authority – the managing authority or intermediate body.
- W<sub>55, 41</sub> – Disapproval of the project applied for OP "Technical Assistance" and re-apply to the competent authority – the managing authority or intermediate body.
- W<sub>58, 41</sub> – Disapproval of the project applied for OP "Environment" and re-apply to the competent authority – the managing authority or intermediate body.

- $W_{61, 41}$  – Disapproval of the project applied for OP "Transport" and re-apply to the competent authority – the managing authority or intermediate body.

Transition  $Z_1$  describing OP "Competitiveness of Bulgarian Economy" is as follows:

$$Z_1 = \langle \{L_Q\}, \{L_1, L_2, L_3, L_4, L_5\}, r_3 \rangle$$

where:

$r_3$	$L_1$	$L_2$	$L_3$	$L_4$	$L_5$
$L_Q$	$W_{Q,1}$	$W_{Q,2}$	$W_{Q,3}$	$W_{Q,4}$	$W_{Q,5}$

- $W_{Q,1}$  – Applying for OP "Competitiveness of Bulgarian Economy" priority development of the economy based on knowledge and innovation;
- $W_{Q,2}$  – Application of the OP "Competitiveness of Bulgarian Economy" with priority to improving the effectiveness of enterprises and promoting supportive business environment;
- $W_{Q,3}$  – Applying for OP "Competitiveness of Bulgarian Economy" priority redursi financial enterprise development;
- $W_{Q,4}$  – Applying for OP "Competitiveness of Bulgarian Economy" priority of strengthening international market positions of Bulgarian economy;
- $W_{Q,5}$  – Application of the OP "Competitiveness of Bulgarian Economy" with priority technical support;

Transition  $Z_2$  describing OP "Regional Development" is as follows:

$$Z_2 = \langle \{L_R\}, \{L_6, L_7, L_8, L_9, L_{10}\}, r_4 \rangle$$

where:

$r_4$	$L_6$	$L_7$	$L_8$	$L_9$	$L_{10}$
$L_R$	$W_{R,6}$	$W_{R,7}$	$W_{R,8}$	$W_{R,9}$	$W_{R,10}$

- $W_{R,6}$  – Application of OP "Regional Development" priority sustainable and integrated urban development;
- $W_{R,7}$  – Application of OP "Regional Development" priority regional and local accessibility;
- $W_{R,8}$  – Application of OP "Regional Development" priority sustainable development of tourism;
- $W_{R,9}$  – Application of OP "Regional Development" priority the establishment of regional and local networks, cooperation and capacity building;
- $W_{R,10}$  – Application under OP "Regional Development" priority technical support;

Transition  $Z_3$  describing OP "Human Resources" is as follows:

$$Z_3 = \langle \{L_S\}, \{L_{11}, L_{12}, L_{13}, L_{14}, L_{15}, L_{16}, L_{17}, L_{18}\}, r_5 \rangle$$

where:

$r_5$	$L_{11}$	$L_{12}$	$L_{13}$	$L_{14}$	$L_{15}$	$L_{16}$	$L_{17}$	$L_{18}$
$L_S$	$W_{s,11}$	$W_{s,12}$	$W_{s,13}$	$W_{s,14}$	$W_{s,15}$	$W_{s,16}$	$W_{s,17}$	$W_{s,18}$

- $W_{S,11}$  – Applying the OP "Human Resources" priority to encourage the creation of new jobs and growth in the labor market, inclusive;
- $W_{S,12}$  – Applying the OP "Human Resources" priority boost productivity and adaptability of employees;
- $W_{S,13}$  – Applying the OP "Human Resources" priority to improve the quality of education and training in accordance with the needs of the labor market to build an economy based on knowledge;
- $W_{S,14}$  – Applying the OP "Human Resources" priority to improve access to education and training;
- $W_{S,15}$  – Applying the OP "Human Resources" priority social inclusion and promoting the social economy;
- $W_{S,16}$  – Applying the OP "Human Resources" priority to improving the effectiveness of the institutions of the labor market, social and health services;
- $W_{S,17}$  – Applying the OP "Human Resources" priority transnational and interregional cooperation;
- $W_{S,18}$  – Applying the OP "Human Resources" priority technical support.

Transition  $Z_4$  describing OP "Administrative Capacity" is as follows:

$$Z_4 = \langle \{L_T\}, \{L_{19}, L_{20}, L_{21}, L_{22}\}, r_6 \rangle$$

where:

$r_6$	$L_{19}$	$L_{20}$	$L_{21}$	$L_{22}$
$L_T$	$W_{T,19}$	$W_{T,20}$	$W_{T,21}$	$W_{T,22}$

- $W_{T,19}$  – Applications under the OP "Administrative Capacity" priority improvement and development of infrastructure for water and wastewater in settlements with over 2000 PE;
- $W_{T,20}$  – Applications under the OP "Administrative Capacity" priority development and improvement of infrastructure for waste treatment;
- $W_{T,21}$  – Applications under the OP "Administrative Capacity" priority protection and restoration of biodiversity;
- $W_{T,22}$  – Applications under the OP "Administrative Capacity" priority technical support.

Transition  $Z_5$  describing OP "Technical Assistance" is as follows:

$$Z_5 = \langle \{L_U\}, \{L_{23}, L_{24}, L_{25}, L_{26}\}, r_7 \rangle$$

where:

$r_7$	$L_{23}$	$L_{24}$	$L_{25}$	$L_{26}$
$L_U$	$W_{U,23}$	$W_{U,24}$	$W_{U,25}$	$W_{U,26}$

- $W_{U,23}$  – Application under OP "Technical Assistance" priority development of transeuropean railway infrastructure and major national transport axes;
- $W_{U,24}$  – Application under OP "Technical Assistance" priority development of road infrastructure along the Trans–European and major national transport axes;

- $W_{U,25}$  – Application under OP "Technical Assistance" priority for improvement: intermodality for passengers and load;
- $W_{U,26}$  – Application under OP "Technical Assistance" priority to improve the conditions for maritime and inland – spearing roads.

Transition  $Z_6$  describing OP "Environment" is as follows:

$$Z_6 = \langle \{L_V\}, \{L_{27}, L_{28}, L_{29}\}, r_8 \rangle$$

where:

<b>r<sub>8</sub></b>	<b>L<sub>27</sub></b>	<b>L<sub>28</sub></b>	<b>L<sub>29</sub></b>
<b>L<sub>V</sub></b>	<b>W<sub>V,27</sub></b>	<b>W<sub>V,28</sub></b>	<b>W<sub>V,29</sub></b>

- $W_{V,27}$  – Application under OP "Environment" priority good governance;
- $W_{V,28}$  – Application under OP "Environment" priority human resource management in the central and local administration, judiciary and civil society;
- $W_{V,29}$  – Application under OP "Environment" priority quality administrative services and e-government development;

Transition  $Z_7$  describing OP "Transport" is as follows:

$$Z_7 = \langle \{L_W\}, \{L_{30}, L_{31}, L_{32}\}, r_9 \rangle$$

where:

<b>r<sub>9</sub></b>	<b>L<sub>30</sub></b>	<b>L<sub>31</sub></b>	<b>L<sub>32</sub></b>
<b>L<sub>W</sub></b>	<b>W<sub>W,30</sub></b>	<b>W<sub>W,31</sub></b>	<b>W<sub>W,32</sub></b>

- $W_{W,30}$  – Application under OP "Transport" priority support for implementing the activities of the Central Coordination Unit, Certifying Authority, Odetirashtiya authority and the Committee to monitor the NSRF (National Strategic Reference Framework);
- $W_{W,31}$  – Application under OP "Transport" priority in its further development and support for the functioning of information system management of the Structural Funds;
- $W_{W,32}$  – Application under OP "Transport" priority distribution of general information regarding structured instruments of the EU;

Transition  $Z_8$  describing beneficiary groups for the OP "Competitiveness of Bulgarian Economy" is as follows:

$$Z_8 = \langle \{L_A\}, \{L_{A1}, L_{A2}, L_{A3}, L_{A4}, L_{A5}\}, r_{10} \rangle$$

where:

<b>r<sub>10</sub></b>	<b>L<sub>A1</sub></b>	<b>L<sub>A2</sub></b>	<b>L<sub>A3</sub></b>	<b>L<sub>A4</sub></b>	<b>L<sub>A5</sub></b>
<b>L<sub>A</sub></b>	<b>W<sub>A,A1</sub></b>	<b>W<sub>A,A2</sub></b>	<b>W<sub>A,A3</sub></b>	<b>W<sub>A,A4</sub></b>	<b>W<sub>A,A5</sub></b>

- $W_{A,A1}$  – Potential beneficiaries wishing to apply under the OP "Competitiveness of Bulgarian Economy" are small and medium enterprises (SMEs);
- $W_{A,A2}$  – Potential beneficiaries wishing to apply under the OP "Competitiveness of Bulgarian Economy" are large enterprises;
- $W_{A,A3}$  – Potential beneficiaries wishing to apply under the OP "Competitiveness of Bulgarian Economy" are researchers or research institutes, universities;

- $W_{A, A4}$  – Potential beneficiaries wishing to apply under the OP "Competitiveness of Bulgarian Economy" are organizations operating as guarantee funds, micro-credit funds or equity funds investing in SMEs;
- $W_{A, A5}$  – Potential beneficiaries wishing to apply for the OP "Competitiveness of Bulgarian Economy" are public and private organizations working in the field of standardization, certification and testing.

Transition  $Z_9$  describing groups of beneficiaries OP "Regional Development" is as follows:

$$Z_9 = \langle \{L_c\}, \{L_{c1}\}, r_{11} \rangle$$

where:

$r_{11}$	$L_{c1}$
$L_c$	$W_{c, c1}$

- $W_{c, c1}$  – Potential beneficiaries wishing to apply under OP "Regional Development", municipalities, businesses with municipal participation, associations of municipalities, NGOs represented in local government.

Transition  $Z_{10}$  describing groups of beneficiaries OP "Human Resources" is as follows:

$$Z_{10} = \langle \{L_E\}, \{L_{E1}, L_{E2}, L_{E3}, L_{E4}, L_{E5}, L_{E6}, L_{E7}, L_{E8}, L_{E9}\}, r_{12} \rangle$$

where:

$r_{12}$	$L_{E1}$	$L_{E2}$	$L_{E3}$	$L_{E4}$	$L_{E5}$	$L_{E6}$	$L_{E7}$	$L_{E8}$	$L_{E9}$
$L_E$	$W_{E, E1}$	$W_{E, E2}$	$W_{E, E3}$	$W_{E, E4}$	$W_{E, E5}$	$W_{E, E6}$	$W_{E, E7}$	$W_{E, E8}$	$W_{E, E9}$

- $W_{E, E1}$  – Potential beneficiaries wishing to apply under the OP "Human Resources" are educational and scientific institutions, centers for vocational training;
- $W_{E, E2}$  – Potential beneficiaries wishing to apply under the OP "Human Resources" are non-governmental organizations (NGOs), academic organizations, institutions of the labor market at national and regional level, consulting firms;
- $W_{E, E3}$  – Potential beneficiaries wishing to apply under the OP "Human Resources" socio-economic partners;
- $W_{E, E4}$  – Potential beneficiaries wishing to apply under the OP "Human Resources" are trade organizations;
- $W_{E, E5}$  – Potential beneficiaries wishing to apply under the OP "Human Resources" are employers;
- $W_{E, E6}$  – Potential beneficiaries wishing to apply under the OP "Human Resources" are research centers;
- $W_{E, E7}$  – Potential beneficiaries wishing to apply under the OP "Human Resources" are municipalities;
- $W_{E, E8}$  – Potential beneficiaries wishing to apply under the OP "Human Resources" are sports clubs and youth organizations;
- $W_{E, E9}$  – Potential beneficiaries wishing to apply under the OP "Human Resources".

Transition  $Z_{11}$  describing beneficiary groups for the OP "Administrative Capacity" is as follows:

$$Z_{11} = \langle \{L_G\}, \{L_{G1}, L_{G2}, L_{G3}, L_{G4}, L_{G5}\}, r_{13} \rangle$$

where:

<b>r<sub>13</sub></b>	<b>L<sub>G1</sub></b>	<b>L<sub>G2</sub></b>	<b>L<sub>G3</sub></b>	<b>L<sub>G4</sub></b>	<b>L<sub>G5</sub></b>
<b>L<sub>G</sub></b>	<b>W<sub>G, G1</sub></b>	<b>W<sub>G, G2</sub></b>	<b>W<sub>G, G3</sub></b>	<b>W<sub>G, G4</sub></b>	<b>W<sub>G, G5</sub></b>

- $W_{G, G1}$  – Potential beneficiaries wishing to apply under the OP "Administrative Capacity" means the municipal administrations;
- $W_{G, G2}$  – Potential beneficiaries wishing to apply under the OP "Administrative Capacity" are municipal companies;
- $W_{G, G3}$  – Potential beneficiaries wishing to apply under the OP "Administrative Capacity" are regional associations;
- $W_{G, G4}$  – Potential beneficiaries wishing to apply under the OP "Administrative Capacity" are associations of municipalities;
- $W_{G, G5}$  – Potential beneficiaries wishing to apply under the OP "Administrative Capacity" means public water companies.

Transition  $Z_{12}$  describing groups of beneficiaries OP "Technical Assistance" is as follows:

$$Z_{12} = \langle \{L_I\}, \{L_{I1}, L_{I2}, L_{I3}, L_{I4}, L_{I5}\}, r_{14} \rangle$$

where:

<b>r<sub>14</sub></b>	<b>L<sub>I1</sub></b>	<b>L<sub>I2</sub></b>	<b>L<sub>I3</sub></b>	<b>L<sub>I4</sub></b>	<b>L<sub>I5</sub></b>
<b>L<sub>I</sub></b>	<b>W<sub>I, I1</sub></b>	<b>W<sub>I, I2</sub></b>	<b>W<sub>I, I3</sub></b>	<b>W<sub>I, I4</sub></b>	<b>W<sub>I, I5</sub></b>

- $W_{I, I1}$  – Potential beneficiaries wishing to apply under the OP "Technical Assistance" are municipalities;
- $W_{I, I2}$  – Potential beneficiaries wishing to apply for OP "Technical Assistance" means the National Company "Railway Infrastructure";
- $W_{I, I3}$  – Potential beneficiaries wishing to apply for OP "Technical Assistance" means the fund "Road Infrastructure";
- $W_{I, I4}$  – Potential beneficiaries wishing to apply for OP "Technical Assistance" means the Executive Agency for Exploration and Maintenance of the Danube ";
- $W_{I, I5}$  – Potential beneficiaries wishing to apply under the OP "Technical Assistance" is an Executive Agency "Maritime Administration".

Transition  $Z_{13}$  describing groups of beneficiaries for OP "Environment" is as follows:

$$Z_{13} = \langle \{L_K\}, \{L_{K1}, L_{K2}, L_{K3}\}, r_{15} \rangle$$

where:

<b>r<sub>15</sub></b>	<b>L<sub>K1</sub></b>	<b>L<sub>K2</sub></b>	<b>L<sub>K3</sub></b>
<b>L<sub>K</sub></b>	<b>W<sub>K, K1</sub></b>	<b>W<sub>K, K2</sub></b>	<b>W<sub>K, K3</sub></b>

- $W_{K, K1}$  – Potential beneficiaries wishing to apply for OP "Environment" means the structure of public administration at all levels;
- $W_{K, K2}$  – Potential beneficiaries wishing to apply for OP "Environment" is the judiciary;

- $W_{K, K3}$  – Potential beneficiaries wishing to apply for OP "Environment" is the civil society.

Transition  $Z_{14}$  describing groups of beneficiaries OP "Transport" is as follows:

$$Z_{14} = \langle \{L_M\}, \{L_{M1}, L_{M2}, L_{M3}, L_{M4}, L_{M5}\}, r_{16} \rangle$$

where:

$r_{16}$	$L_{M1}$	$L_{M2}$	$L_{M3}$	$L_{M4}$	$L_{M5}$
$L_M$	$W_{M, M1}$	$W_{M, M2}$	$W_{M, M3}$	$W_{M, M4}$	$W_{M, M5}$

- $W_{M, M1}$  – Potential beneficiaries wishing to apply for OP "Transport" means the Ministry of Finance - Central Coordination Unit;
- $W_{M, M2}$  – Potential beneficiaries wishing to apply for OP "Transport" means the certification authority;
- $W_{M, M3}$  – Potential beneficiaries wishing to apply for OP "Transport" means the audit authority;
- $W_{M, M4}$  – Potential beneficiaries wishing to apply for OP "Transport" means the Managing Authority of OP "Technical Assistance"
- $W_{M, M5}$  – Potential beneficiaries wishing to apply under the OP "Transport" are units supporting the dissemination of information for structural instruments at regional and local level.

Transition  $Z_{15}$  describing OP is as follows:

$$Z_{15} = \langle \{L_O, L_P\}, \{L_Q, L_R, L_S, L_T, L_U, L_V, L_W\}, r_{17} \rangle$$

where:

$r_{17}$	$L_Q$	$L_R$	$L_S$	$L_T$	$L_U$	$L_V$	$L_W$
$L_O$	$W_{O, Q}$	$W_{O, R}$	$W_{O, S}$	$W_{O, T}$	$W_{O, U}$	$W_{O, V}$	$W_{O, W}$
$L_P$	$W_{P, Q}$	$W_{P, R}$	$W_{P, S}$	$W_{P, T}$	$W_{P, U}$	$W_{P, V}$	$W_{P, W}$

- $W_{O, Q}$  – Applying a "small project" OP "Competitiveness of Bulgarian Economy";
- $W_{P, Q}$  – Applying a "major project" OP "Competitiveness of Bulgarian Economy";
- $W_{O, R}$  – Applying a "small project" OP "Regional Development";
- $W_{P, R}$  – Applying a "major project" under OP "Regional Development";
- $W_{O, S}$  – Application for a "small project" OP "Human Resources";
- $W_{P, S}$  – Application for a "major project" OP "Human Resources";
- $W_{O, T}$  – Application of "small project" OP "Administrative Capacity";
- $W_{P, T}$  – Application of "major project" OP "Administrative Capacity";
- $W_{O, U}$  – Applying a "small project" OP "Technical Assistance"
- $W_{P, U}$  – Applying a "major project" OP "Technical Assistance"
- $W_{O, V}$  – Applying the "small project" OP "Environment";
- $W_{P, V}$  – Applying the "major project" under OP "Environment";
- $W_{O, W}$  – Applying a "small project" OP "Transport";
- $W_{P, W}$  – Applying a "major project" OP "Transport".

Transition  $Z_{16}$  describing MA of OP "Competitiveness of Bulgarian Economy" is as follows:

$$Z_{16} = \langle \{L_B, L_{B1}, L_{B3}\}, \{L_{B2}\}, r_{18} \rangle$$

where:

$r_{18}$	$L_{B2}$
$L_B$	$W_{B, B2}$
$L_{B1}$	$W_{B1, B2}$
$L_{B3}$	$W_{B3, B2}$

- $W_{B, B2}$  – Presentation of the project to the governing body of the Ministry of Economy and Energy Operational Programme "Competitiveness of Bulgarian Economy";
- $W_{B1, B2}$  – Managing Authority of OP "Competitiveness of Bulgarian Economy" is "European Funds for Competitiveness at the Ministry of Economy and Energy";
- $W_{B3, B2}$  – submission to the Ministry of Economy and Energy through the intermediate Unit – Executive Agency for Promotion of Small and Medium Enterprises.

Transition  $Z_{17}$  describing procedures design approval under the OP "Competitiveness of Bulgarian Economy" is as follows:

$$Z_{17} = \langle \{L_{42}, L_{44}\}, \{L_{63}\}, r_{19} \rangle$$

where:

$r_{19}$	$L_{63}$
$L_{42}$	$W_{42, 63}$
$L_{44}$	$W_{44, 63}$

- $W_{42, 63}$  – Approval of the project applied for OP "Competitiveness of Bulgarian Economy", and check the performance of the beneficiaries under the OP "Competitiveness of Bulgarian Economy";
- $W_{44, 63}$  – Financing of the project applied for OP "Competitiveness of Bulgarian Economy", and check the performance of the beneficiaries under the OP "Competitiveness of Bulgarian Economy".

Transition  $Z_{18}$  describing MA OP "Human Resources" is as follows:

$$Z_{18} = \langle \{L_F, L_{F4}\}, \{L_{F5}\}, r_{20} \rangle$$

where:

$r_{20}$	$L_{F5}$
$L_F$	$W_{F, F5}$
$L_{F4}$	$W_{F4, F5}$

- $W_{F, F5}$  – Presentation of the project to the governing body of the Agency for Employment and Social Assistance Agency of the OP "Human Resources";
- $W_{F4, F5}$  – Presentation to the Ministry of Education and Employment Agency and the Agency for Social Assistance.

Transition  $Z_{19}$  procedures describing design approval under the OP "Human Resources" is as follows:

$$Z_{19} = \langle \{L_{48}, L_{50}\}, \{L_{65}\}, r_{21} \rangle$$

where:

$r_{21}$	$L_{65}$
$L_{48}$	$W_{48, 65}$
$L_{50}$	$W_{50, 65}$

- $W_{48, 65}$  – Approval of the project applied for OP "Human Resources" and check the implementation of beneficiary–OP "Human Resources";
- $W_{50, 65}$  – Financing of the project applied for OP "Human Resources" and check the implementation of beneficiary–OP "Human Resources".

Transition  $Z_{20}$  describing MA of OP "Regional Development" is as follows:

$$Z_{20} = \langle \{L_D, L_{D3}\}, \{L_{D2}\}, r_{22} \rangle$$

where:

$r_{22}$	$L_{D2}$
$L_D$	$W_{D, D2}$
$L_{D3}$	$W_{D3, D2}$

- $W_{D, D2}$  – Presentation of the project to the governing body of the Ministry of Regional Development and Public Works of OP "Regional Development";
- $W_{D3, D2}$  – Presentation to the regional departments of the Directorate in the six planning regions in the Ministry of Regional Development and Public Works.

Transition  $Z_{21}$  Procedures describing approval of the project "Regional Development" is as follows:

$$Z_{21} = \langle \{L_{45}, L_{47}\}, \{L_{64}\}, r_{23} \rangle$$

where:

$r_{23}$	$L_{64}$
$L_{45}$	$W_{45, 64}$
$L_{47}$	$W_{47, 64}$

- $W_{45, 64}$  – Approval of the project applied for OP "Regional Development", and check the performance of the beneficiary under OP "Regional Development";
- $W_{47, 64}$  – Financing of the project applied for OP "Regional Development", and check the performance of the beneficiary under OP "Regional Development".

Transition  $Z_{22}$  describing MA of OP "Administrative Capacity" is as follows:

$$Z_{22} = \langle \{L_H, L_{H1}, L_{H3}, L_{H5}\}, \{L_{H4}, L_{H6}\}, r_{24} \rangle$$

where:

<b>r<sub>24</sub></b>	<b>L<sub>H4</sub></b>	<b>L<sub>H6</sub></b>
<b>L<sub>H</sub></b>	W <sub>H, H4</sub>	W <sub>H, H6</sub>
<b>L<sub>H3</sub></b>	W <sub>H3, H4</sub>	False
<b>L<sub>H5</sub></b>	False	W <sub>H5, H6</sub>

- W<sub>H, H4</sub> – Presentation of the project to the governing body of the Ministry of Environment and Water Programme "Administrative Capacity";
- W<sub>H3, H4</sub> – Presentation to the Directorate "EU Funds for Environment" at the Ministry of Environment and Water;
- W<sub>H, H6</sub> – Presentation of the project to the governing body of the Ministry of Regional Development and Public Works Programme "Administrative Capacity";
- W<sub>H5, H6</sub> – Presentation to the Department "ISPA Implementing Agency, Public Works and Water Systems" at the Ministry of Regional Development and Public Works.

Transition Z<sub>23</sub> procedures describing design approval under the OP "Administrative Capacity" is as follows:

$$Z_{23} = \langle \{L_{51}, L_{53}\}, \{L_{66}\}, r_{25} \rangle$$

where:

<b>r<sub>25</sub></b>	<b>L<sub>66</sub></b>
<b>L<sub>51</sub></b>	W <sub>51, 66</sub>
<b>L<sub>53</sub></b>	W <sub>53, 66</sub>

- W<sub>51, 66</sub> – Approval of the project applied for OP "Administrative Capacity" and check the implementation of beneficiary–OP "Administrative Capacity";
- W<sub>53, 66</sub> – Financing of the project applied for OP "Administrative Capacity" and check the implementation of beneficiary–OP "Administrative Capacity".

Transition Z<sub>24</sub> describing MA of OP "Technical Assistance" is as follows:

$$Z_{24} = \langle \{L_J, L_{J4}\}, \{L_{J5}\}, r_{26} \rangle$$

where:

<b>r<sub>26</sub></b>	<b>L<sub>J5</sub></b>
<b>L<sub>J</sub></b>	W <sub>J, J5</sub>
<b>L<sub>J4</sub></b>	W <sub>4J, J5</sub>

- W<sub>J, J5</sub> – Presentation of the project to the governing body of the National Company "Railway Infrastructure" OP "Technical Assistance"
- W<sub>4J, J5</sub> – Presentation to the Executive Agency "Maritime Administration" at the National Company "Railway Infrastructure".

Transition Z<sub>25</sub> procedures describing design approval under the OP "Technical Assistance" is as follows:

$$Z_{25} = \langle \{L_{54}, L_{56}\}, \{L_{67}\}, r_{27} \rangle$$

where:

$r_{27}$	$L_{67}$
$L_{54}$	$W_{54, 67}$
$L_{56}$	$W_{56, 67}$

- $W_{54, 67}$  – Approval of the project applied for OP "Technical Assistance", and check the performance of the beneficiary under the OP "Technical Assistance";
- $W_{56, 67}$  – Financing of the project applied for OP "Technical Assistance", and check the performance of the beneficiary under the OP "Technical Assistance".

Transition  $Z_{26}$  describing MA of OP "Environment" is as follows:

$$Z_{26} = \langle \{L_L, L_{L3}\}, \{L_{L4}\}, r_{28} \rangle$$

where:

$r_{28}$	$L_{L4}$
$L_L$	$W_{L, L4}$
$L_{L3}$	$W_{L3, L4}$

- $W_{L, L4}$  – Presentation of the project to the governing body of the Ministry of State Administration and Administrative Reform Programme "Environment";
- $W_{L3, L4}$  – Introduction to Directorate "European coordination and international cooperation" to the Ministry of State Administration and Administrative Reform.

Transition  $Z_{27}$  procedures describing design approval under the OP "Environment" is as follows:

$$Z_{27} = \langle \{L_{57}, L_{59}\}, \{L_{68}\}, r_{29} \rangle$$

where:

$r_{29}$	$L_{68}$
$L_{57}$	$W_{57, 68}$
$L_{59}$	$W_{59, 68}$

- $W_{57, 68}$  – Check–implementation of the beneficiary under OP "Environment" and approval of the project applied for OP "Environment" ;
- $W_{59, 68}$  – Check–implementation of the beneficiary under OP "Environment" and financing of the project applied for OP "Environment".

Transition  $Z_{28}$  describing Managing Authority OP "Transport" is as follows:

$$Z_{28} = \langle \{L_N, L_{N1}\}, \{L_{N2}\}, r_{30} \rangle$$

where:

$r_{30}$	$L_{N2}$
$L_N$	$W_{N, N2}$
$L_{N1}$	$W_{N1, N2}$

- $W_{N, N2}$  – Presentation of the project to the governing body of the Ministry of Finance (MOF) of OP "Transport";

- $W_{N1, N2}$  – Introduction to the "Management of EU Funds" Directorate at the Ministry of Finance (MoF).

Transition  $Z_{29}$  procedures describing design approval under the OP "Transport" is as follows:

$$Z_{27} = \langle \{L_{60}, L_{62}\}, \{L_{69}\}, r_{31} \rangle$$

where:

$r_{31}$	$L_{69}$
$L_{60}$	$W_{60, 69}$
$L_{62}$	$W_{62, 69}$

- $W_{60, 69}$  – Approval of the project applied for OP "Transport" and check the implementation of beneficiary–OP "Transport";
- $W_{62, 69}$  – Financing of the project applied for OP "Transport" and check the implementation of beneficiary–OP "Transport".

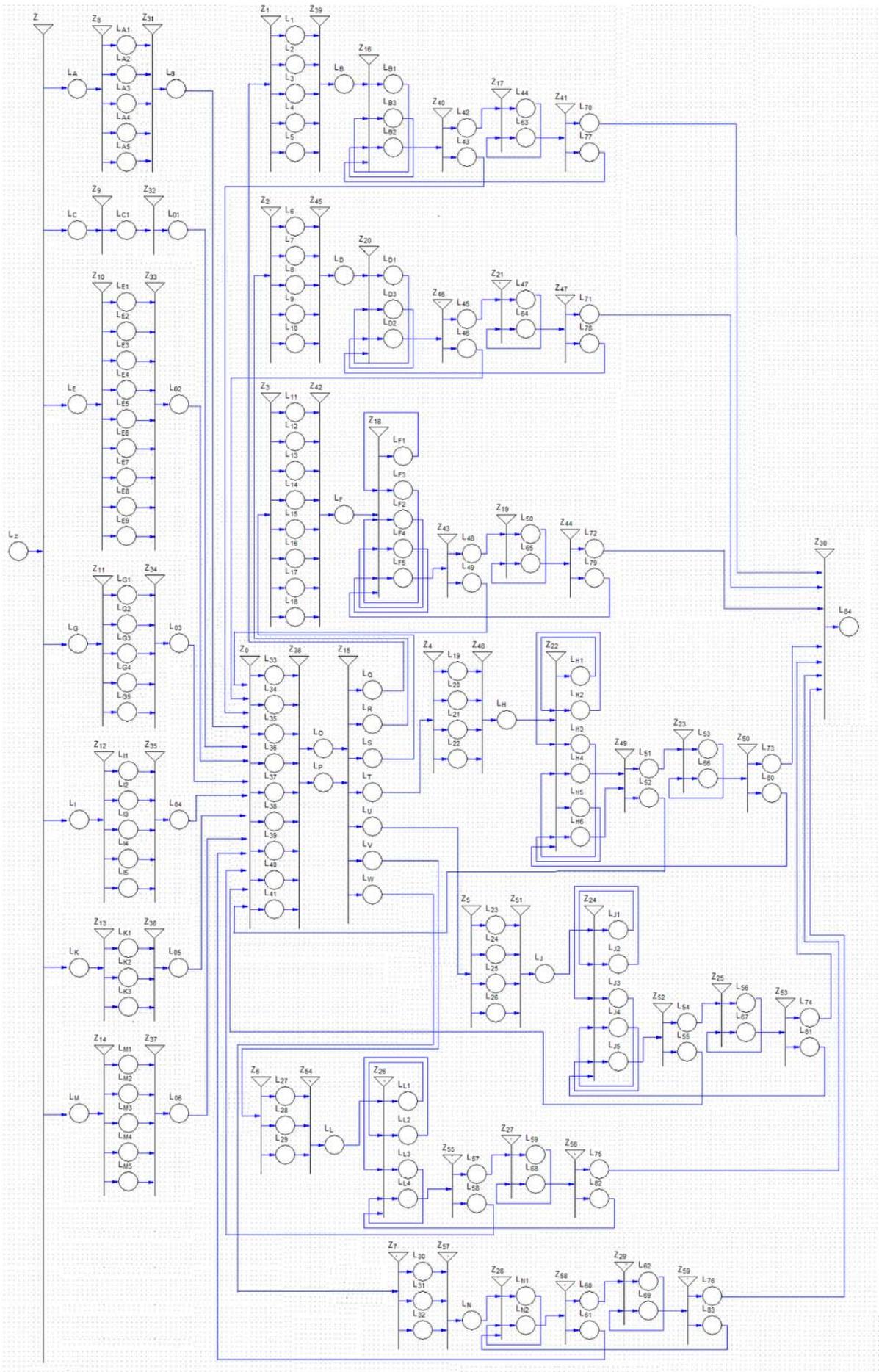
Transition  $Z_{30}$  describing parts of the procedures is as follows:

$$Z_{30} = \langle \{L_{70}, L_{71}, L_{72}, L_{73}, L_{74}, L_{75}, L_{76}\}, \{L_{84}\}, r_{32} \rangle$$

where:

$r_{32}$	$L_{84}$
$L_{70}$	$W_{70, 84}$
$L_{71}$	$W_{71, 84}$
$L_{72}$	$W_{72, 84}$
$L_{73}$	$W_{73, 84}$
$L_{74}$	$W_{74, 84}$
$L_{75}$	$W_{75, 84}$
$L_{76}$	$W_{76, 84}$

- $W_{70, 84}$  – In a lawful execution, the beneficiary shall report to the Ministry of Economy and proceed to implement the project;
- $W_{71, 84}$  – In a lawful execution, the beneficiary shall report to the Ministry of Regional Development and Public Works and proceed with the project;
- $W_{72, 84}$  – In a lawful execution, the beneficiary shall report to the Ministry of Labour and Social Policy and proceed with the project;
- $W_{73, 84}$  – In a lawful execution, the beneficiary shall report to the Ministry of Environment and Water, and proceed to implement the project;
- $W_{74, 84}$  – In a lawful execution, the beneficiary shall report to the Ministry of Transport and proceed to implement the project;
- $W_{75, 84}$  – In a lawful execution, the beneficiary shall report to the Ministry of State Administration and Administrative Reform, and proceed to implement the project;
- $W_{76, 84}$  – In a lawful execution, the beneficiary shall report to the Ministry.



## Conclusion

The National Development Plan analyzes the current state of the country, aiming to describe the socioeconomic situation of the country, to identify the main socioeconomic problems and declining regions, which hinders the country development. Parallel to this it's searching for compliance with the dynamics, trends and developments in the EU through a comparative analysis that in the future will identify the most important areas of discrepancy between Bulgaria and the EU. Data for individual OPs were taken from the National Strategic Reference Framework for Bulgaria, which has two main objectives: increasing the competitiveness of the economy and robust growth and development of human capital for employment, income and social integration.

The generalized net model described above offers the following opportunities for utilization:

- Simulation of the application process with projects under OP – from the perspectives of the individual candidate, the project administrators and the project funding bodies;
- Management of the application process with projects under OP – from the perspectives of the projects administrators and project funding bodies;
- Simulation of the application process with projects under a change of purpose – from the perspective of administrators of projects;
- Simulation of the application process with projects under a change of financial resources – from the perspective of the funding bodies of the projects.

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