

Asset management models for growing economies

- General Directorate for National Roads and Motorway





Presentation plan

1. Where did I actually come from?,
2. Some data about my homeland and changes that determined the rest of my presentation,
3. What is the subject matter of my action?,
4. How I understand the management of road infrastructure?,
5. What tools do we have?,
6. What changes in model of the management of road infrastructure in Poland?,
7. New important tool,
8. Conclusions.

General information about Poland:

- Population: 38 424 000 (*January 2017*)
- Unemployment rate: 7,3%
- GDP per capita: 14 655 *USD*
- Inflation rate: 1,8%
- Sales value in the whole construction sector (2015): 45,6 bln. *USD*
- Growth of the road construction sector: *about 10%*

<ul style="list-style-type: none">• Debates of representatives of power and opposition that started the process of transformation in Poland• First partially free and democratic elections• Price release	1989	
	1990	<ul style="list-style-type: none">• Acts introducing the basis of a market economy• First law on municipal self-government• First after 2nd World War –democratic election of the President
<ul style="list-style-type: none">• Laws introducing the basis of a market economy• First law on municipal self-government	1991	
	1992	<ul style="list-style-type: none">• Entry into force of the Constitutional Act of 17 October 1992
<ul style="list-style-type: none">• Completion of withdrawing troops from the Russian Federation from Poland (<i>former USSR troops stationed Since 1944</i>)	1993	

<ul style="list-style-type: none"> Poland's accession to the Organization for Economic Co-operation and Development (OECD) 	1995	<ul style="list-style-type: none"> Introduction of the law on public procurement
	1996	<ul style="list-style-type: none"> Denomination of the Polish currency in order to counter inflation
	1997	<ul style="list-style-type: none"> Entry into force of the Constitution of the Republic of Poland of 2 April 1997
<ul style="list-style-type: none"> Opening of Poland's membership negotiations with the European Union 	1998	
	1999	<ul style="list-style-type: none"> Poland's accession to NATO The entry into force of the reform package: administration, health care, pensions, education
<ul style="list-style-type: none"> Liquidity of the Polish currency 	2000	
	2004	<ul style="list-style-type: none"> Poland's accession to the European Union Poland's first elections to the European Parliament
<ul style="list-style-type: none"> Poland's accession to the Schengen area 	2007	
	2011	<ul style="list-style-type: none"> Polish Presidency of the Council of the European Union

Public roads network:

420 000 km

Length of national roads:

19 200 km

including:

Network of highways:

3161 km

1627,3 km motorways

1533,7 km expressways



Management Tools

✓ **Network Actions;**

Management data for the implementation of "Network Actions" are obtained on the basis of the conducted Road Construction Diagnosis, Bridge Management System and Road Traffic Safety Identification and Assessment.

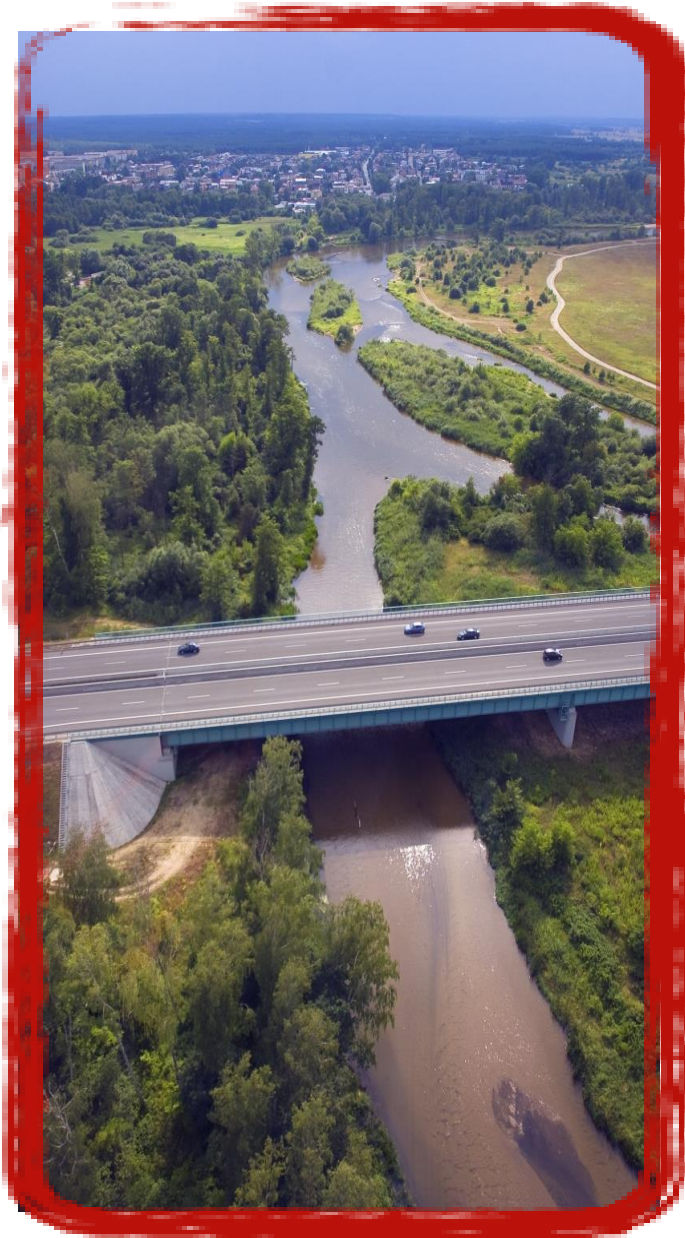
Supporting data is information about traffic load, including heavy traffic.

- Routine maintenance
- Structural maintenance
- Structural maintenance of road engineering facilities
- Traffic safety management
- **Value Engineering**

✓ **Complementary activities;**

Management data for the implementation of "Complementary Activities" are obtained on the basis of identification and assessment of the needs for the provision, protection and modernization of the necessary infrastructure.

- Weighing vehicles
- Maintenance of supporting infrastructure
- **Management of supporting devices**



Tools to achieve goals;

- ✓ Annual road network diagnostics that allows you to designate sections where ongoing maintenance becomes unprofitable and the section should be subjected to other treatments than maintenance,
- ✓ Results of the General Traffic Measurements - allowing identification of the sections with the highest traffic volumes and referring them to planned activities,
- ✓ Annual bridge surveys,
- ✓ Patrolling roads,
- ✓ Information from the Police about road accidents and their causes,
- ✓ Safety checks and audits.



After aggregation and processing of measurement data of individual parameters, the surface sections are classified into one of four classes;

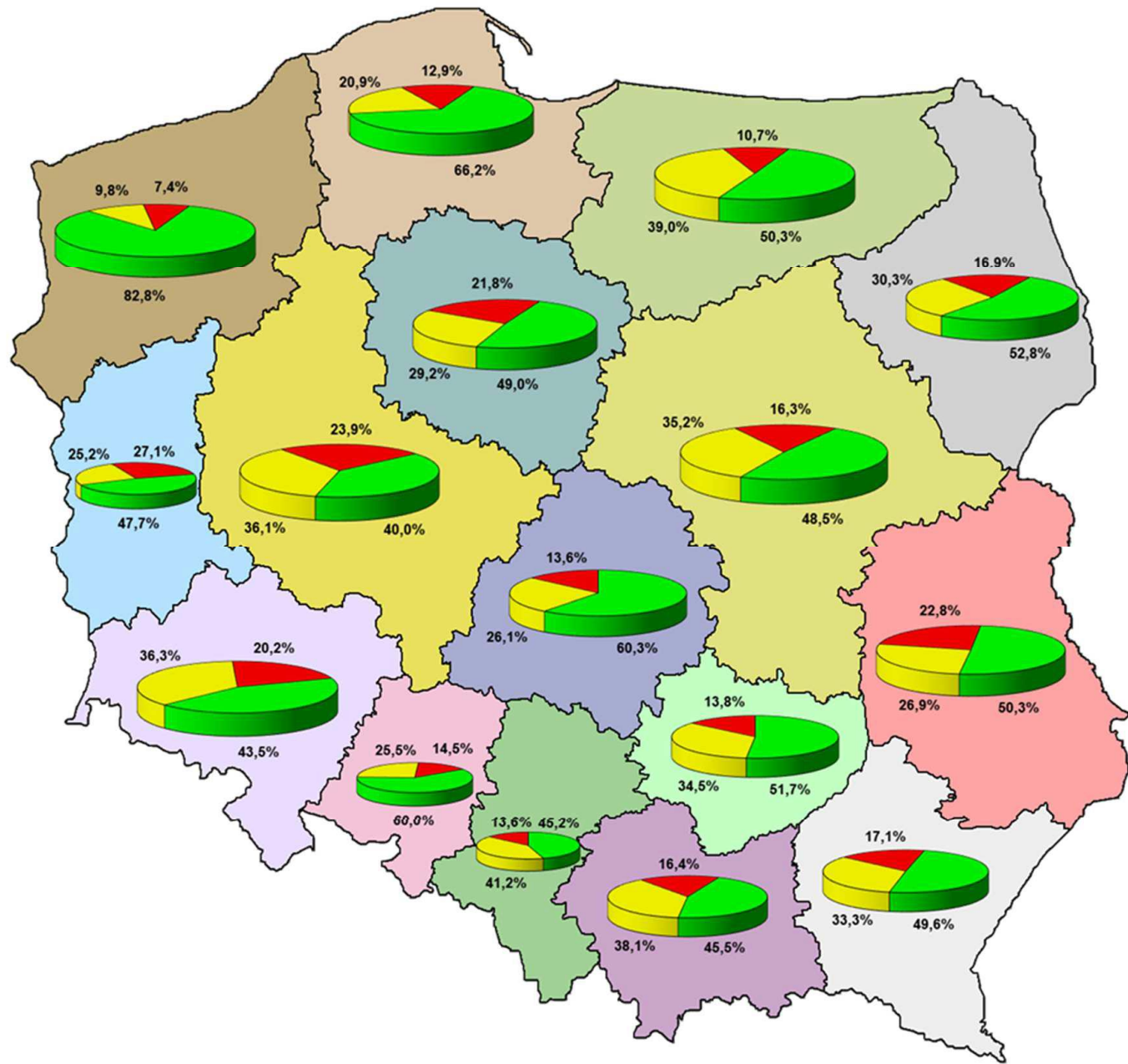
Class A good condition	Desired Level	New, refurbished and operated pavements, permissible sporadic damage, no need for intervention
Class B satisfactory condition		
Class C unsatisfactory condition	Warning Level	Surface with damage that requires repair planning
Class D bad condition	Critical Level	Surface with damage requiring immediate repair

How it really looks ?

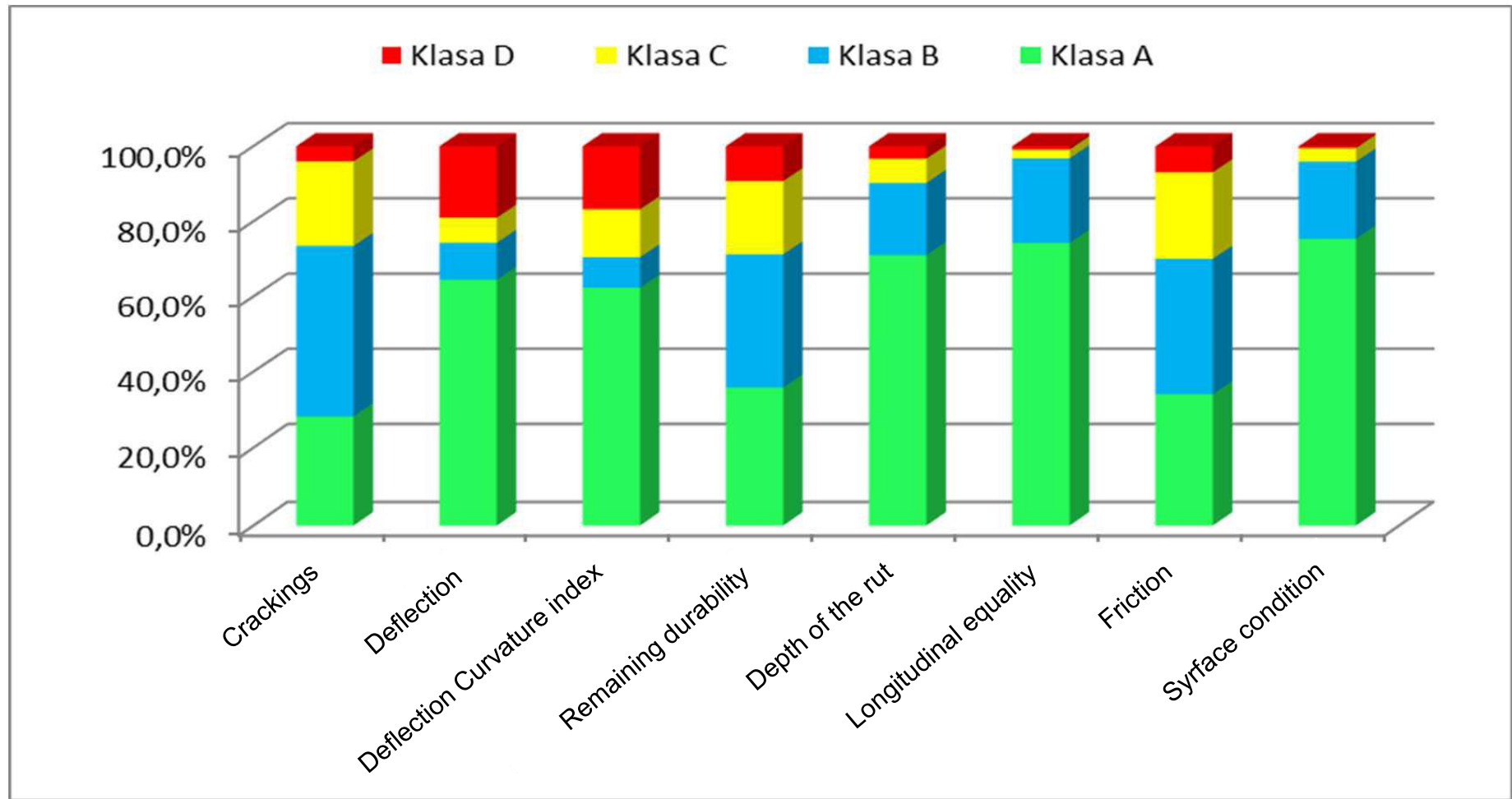
Condition	[km]	[%]
Desired	10 690	51,8%
Warning	6 461	31,3%
Critical	3,474	16,9%

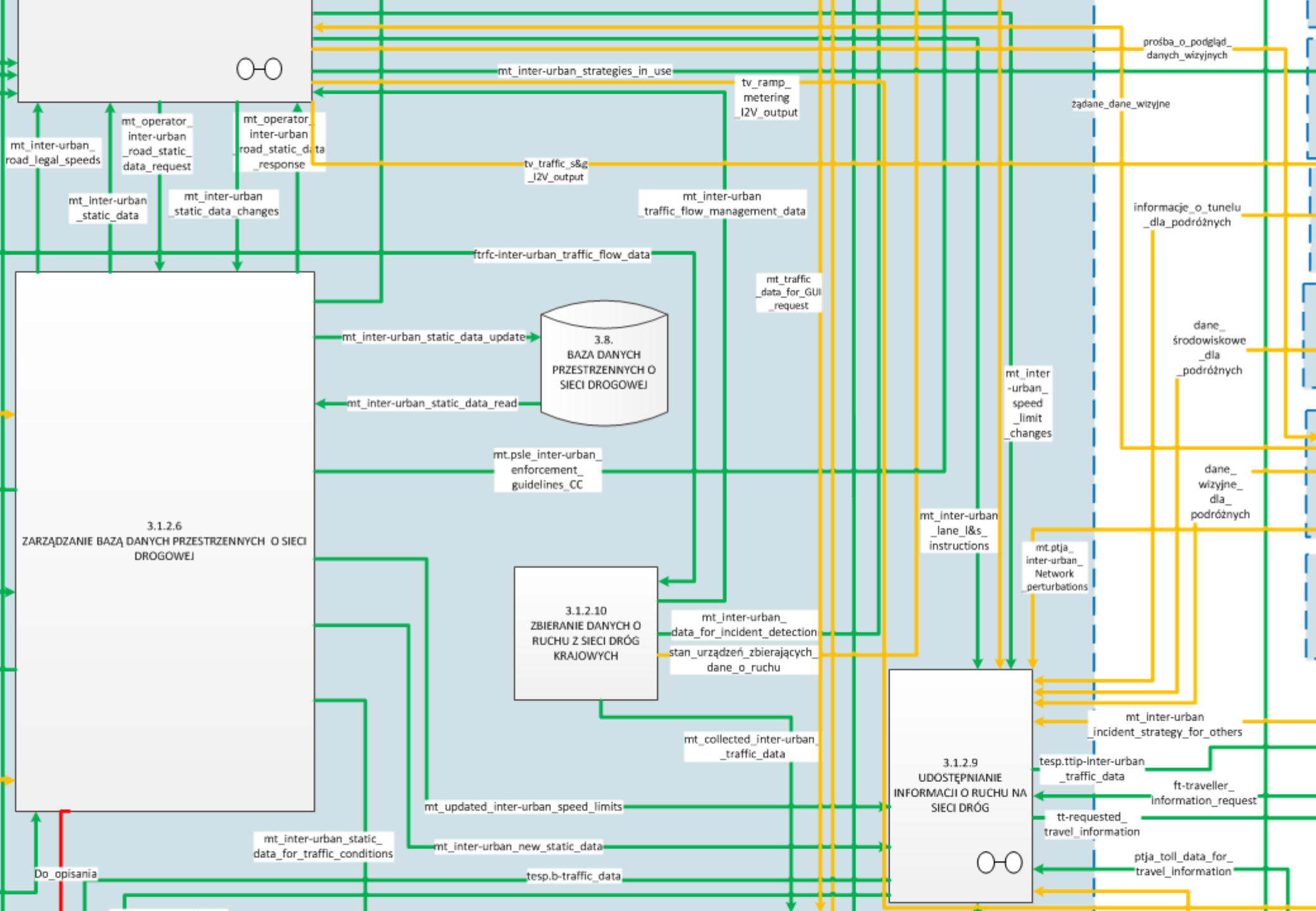


Assessment of the surface condition of national roads in individual voivodships / Branches



Percentage distribution of parameters of the surface condition





Factors of changes in the road infrastructure management model



The standard provided to road users is significantly improved.

Travelers can benefit not only from new sections of national roads, but also from modern car parks, modern parking spaces, modern variable content labels or simply improved visibility. There are new security solutions or travel comfort.

Simultaneously with the improvement of the standard grows the awareness and expectations of users.

Currently there is no tolerance for deviations from the standard such as unevenness of the surface, unpaved roadsides or cumulation of traffic and the formation of so-called local capacity limitations.

Factors of changes in the road infrastructure management model

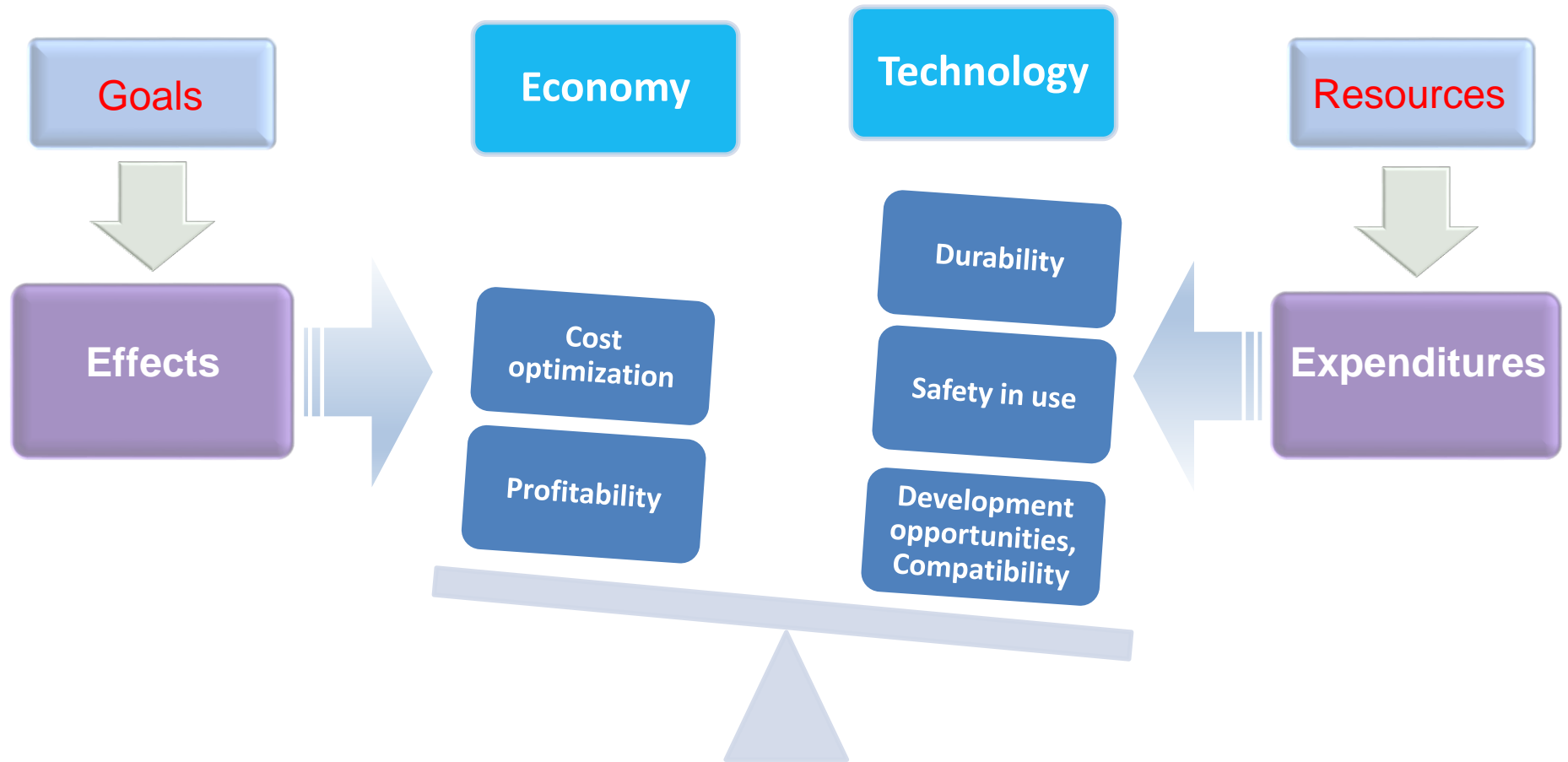


1. Expectations to stimulate links between agglomerations,
2. Expectation of leveling development opportunities at the level of local self-government units,
3. Expectations to be able to save time,
4. Expectations to stimulate the growth of the sectors of construction, maintenance, service providers and suppliers in the road sector,
5. Expectations to guarantee current multi-track access to possibly full information on the state of the road network, traffic congestion at any of the road network, hazards, and finally optimum route selection.

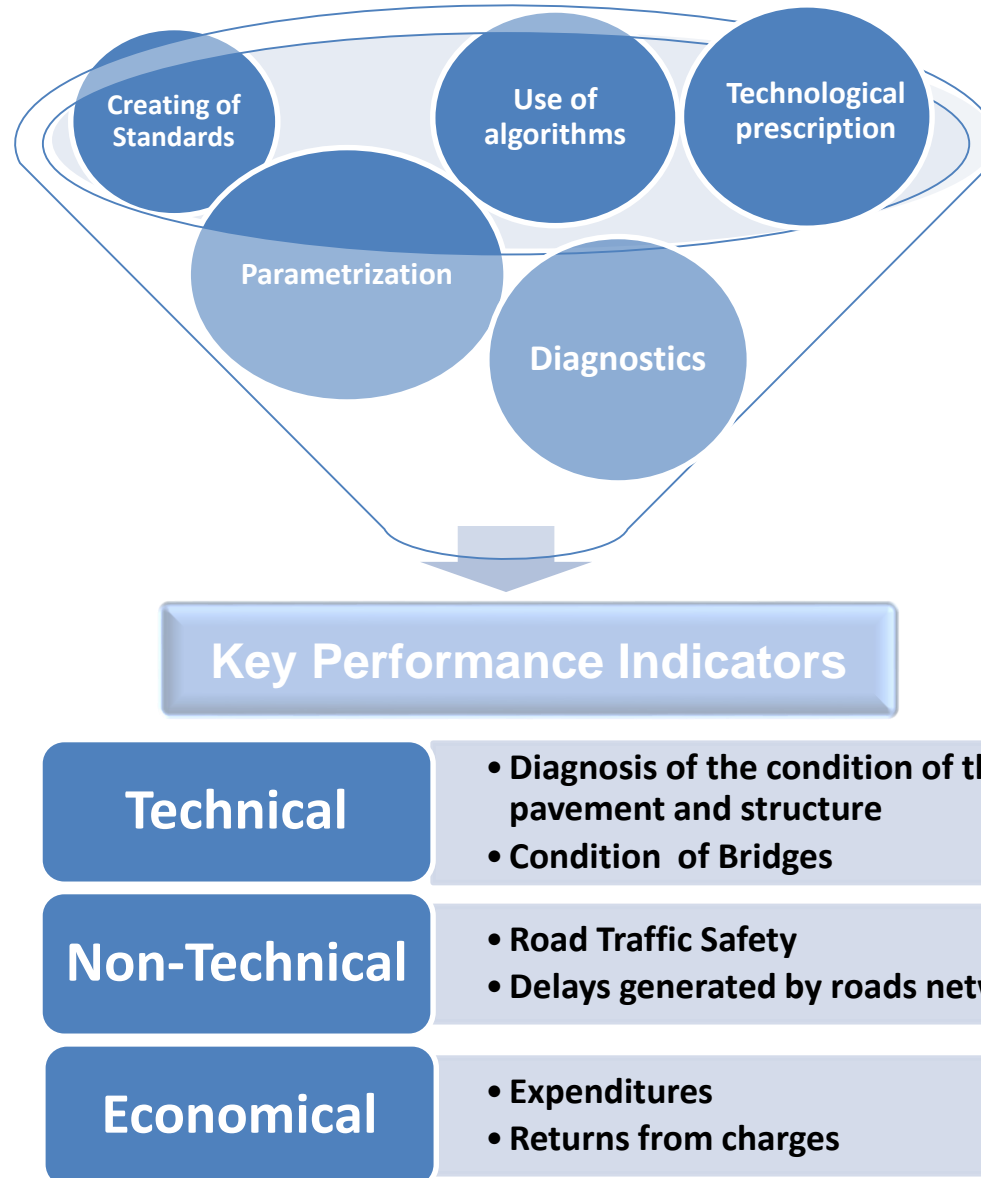
What is effective asset management?



Adopting defined **goals** and allocating **resources** to deliver them for optimizing product lifecycle **efficiency**.



What is effective asset management?



Asset management models



- ✓ **Traditional model** - in which the road manager has his own road service, equipment and people.
- ✓ **Model of diffused orders** – where the clue of diffusion is assortment of works. A model in which the road manager separates the assortment of works and commissioned a separate contractor to act on them, such as pavement repair, lighting replacement. In this model, the contracting authority determines precisely the method of operation, frequency and technology.
- ✓ **Indicator model** - in which the road manager determines the expected effects of maintenance activities, determines the indicators that map these effects, orders linear (*on a given road*) or area (*in a given territory*) maintenance activities based on the method proposed by the contractor, checking whether the assumed indicators have been met.
- ✓ **Mixed models** - resulting from the simultaneous use of the aforementioned models.

The dominant asset management model until 2016

Asset management model	Number of contracts	Value of contracts
Diffused	1122	240 <i>mln USD</i>
Linear	29	80 <i>mln USD</i>
Areal	5	16 <i>mln USD</i>

By 2016, the dominant model for managing the road infrastructure was the Diffused model.

Its application, while developing the national road network, results the management of a large number (over 1100) of contracts.

This not only causes coordination problems, but also results in high administration costs for such numer contracts.

As of 2010, the GDDKiA also uses a linear or area indicator model. Based on their own experience, the recommendations of external consultants and the analysis of maintenance methods in developed countries, it was recommended to gradually expand the use of the indicator model.

PBC

Strengths

- Targeting the motivation of the Contractor to achieve qualitative results because this affects on the financial result,
- The contractor is motivated to proactively supervise the property entrusted to him and to respond to threats before they arise (eg, the Contractor will immediately repair a defect that may be propagated, thereby avoiding additional costs),
- The Orderer focuses on controlling the effects of maintenance activities and not the correctness of the methods used for this purpose,
- Easier management by integrating multiple tasks into one contract,
- Financial stability (long-term contracts),
- The contractor has the opportunity to introduce innovative solutions, technologies that will achieve specific quality indicators,
- Reduction of the administrative costs associated with the need to carry out multiple contracts and multi-contract management.

Weakness

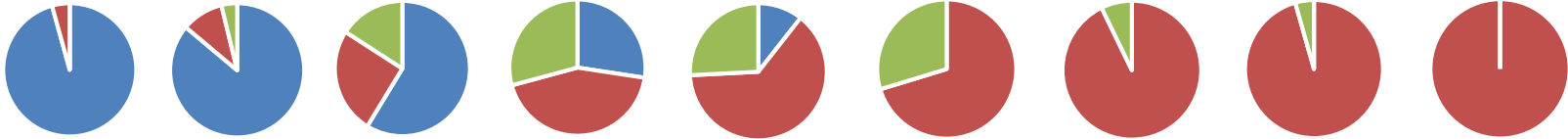
- Need for a very detailed description of the expected quality results,
- Possible difficulties to return to performing maintenance tasks with their own forces.

Opportunity

- The contractor is responsible for all interventions, work, technology, materials. Contractor therefore optimizes (qualitatively, financially) the possibility of achieving the expected result,
- The possibility of detailed describing the expected quality results and thus the possibility of giving particular importance to those elements which are the most important for the Purchaser,
- No need to buy and maintain own equipment,
- Development of the sector Performers of complex maintenance tasks and the possibility of consolidation activities on the market Contractors, eg through the formation of consortia.

Threats

- The contractor must prepare the offer very well, paying special attention to the valuation of risks that may arise in the long term of the contract, also in connection with potential price changes.
- Possible misunderstandings between the Contractor and the Purchaser regarding the method of measuring the quality and results by the Ordering Party,



Diffused	95,7%	86,1%	58,7%	27,4%	10,6%	0%	0%	0%	0%
Areal / Linear	4,3%	10,1%	25,4%	43,4%	63,6%	70,3%	92,8%	95,6%	100%
Quasi – Standard	0%	3,8%	15,9%	29,2%	25,8%	29,7%	7,2%	4,4%	0%
	2016	2017	2018	2019	2020 ... 2022	2023	2024 ... 2026		

Diffused Model

- A large number of contracts for execution of particular assortments of works
- Contractor's remuneration dependent on orders issued by the employee of the Employer,
- Lack of standardization of contracts and time of performing particular maintenance tasks,
- Lack of standardization of road network maintenance quality,
- Implementation of a large part of maintenance tasks by the Employer's employees.

Model Quasi-Standard

- One comprehensive agreement in the Area / District area,
- A schedule specifying the specific moments of performance of activities,
- Standardization of contracts,
- Standardization of periods of maintenance,
- Standardization of quality.
- Implementation of part of maintenance tasks by the Employer's employees.

PBC Model Areal / Linear

- One comprehensive agreement in the area
- GDDKiA does not interfere with the time and manner of activities, it only determines the multiplicity
- The contracting authority concentrates on controlling the effects of maintenance activities rather than the correctness of the methods used,
- Settlement based on a recurring monthly salary,
- Targeting the Contractor to achieve qualitative results,
- Lack of parameterized maintenance standards, large role of assessment conducted by the Ordering Party.
- Employees of the Employer focus on control and supervision.

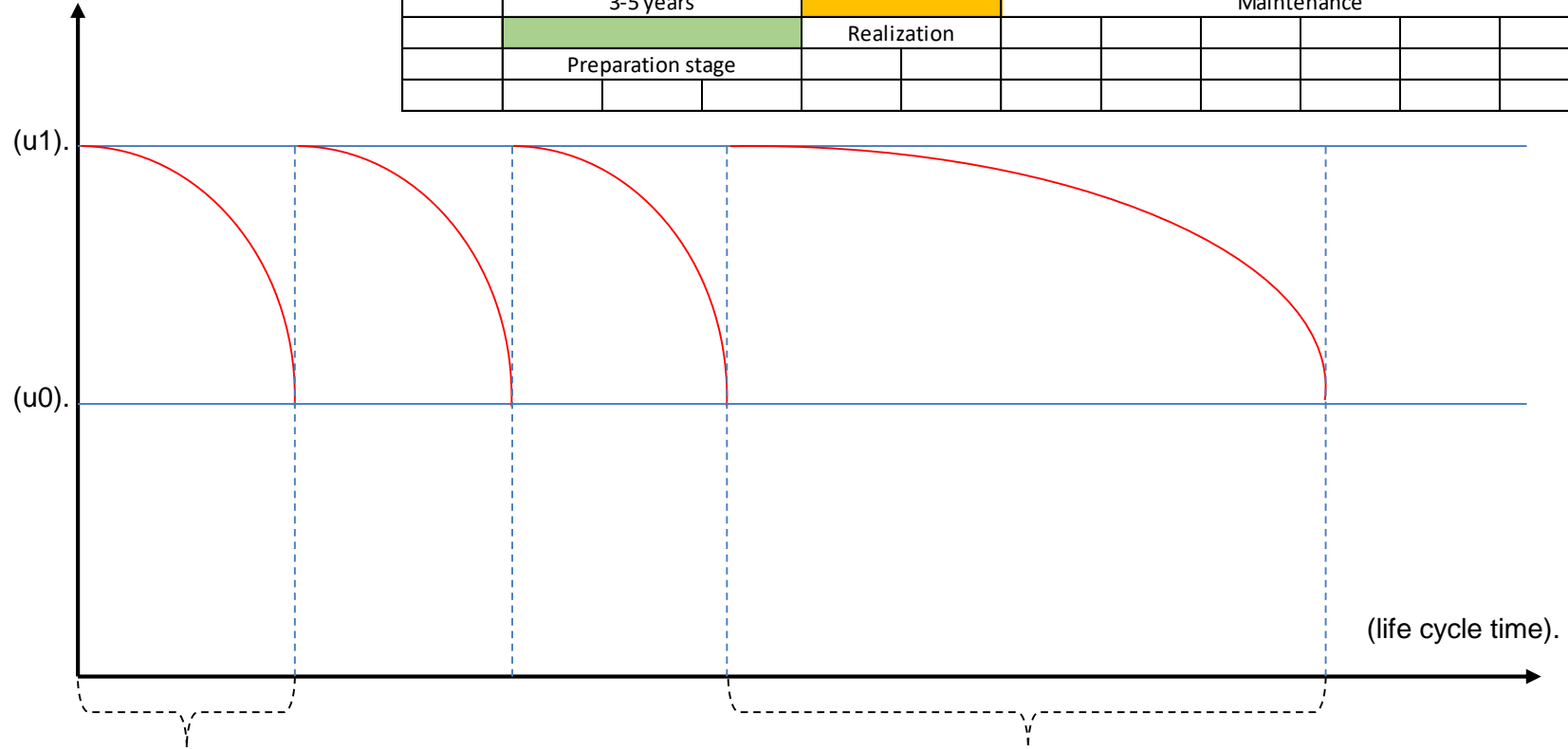
Clear PBC

- Standard long-term agreement covering the widest possible area,
- The ordering party does not interfere with time and methods of maintenance,
- The basis for the assessment is the Quality Indicator designated by the Purchaser, based on carefully parameterized maintenance standards of the road network,
- Easier and cheaper contract management by focusing on a larger area and scope of activities in a single contract,
- Possibility of applying in the situation of developed and stabilized sector Contractors of maintenance work,
- Employees of the Employer are focused on controlling the effect of the Contractor.

Value Engineering – how to take care of maintenance during realization;

							?				
					2 seasons						
		3-5 years				Maintenance					
				Realization							
	Preparation stage										

(Usable value)



Classical life cycle length, followed by a decline in usable value that necessitates reproduction

Longer life cycle associated with improved asset performance indicators

Thank you for your attention



**Generalna Dyrekcja
Dróg Krajowych i Autostrad**