

MAINTENANCE FORUM 2018

CONCEPT OF A COMPREHENSIVE INTEGRATED VEHICLE FLEET MAINTENANCE MANAGEMENT

Authors:

Doc dr Davor Vujanović

M. Sc. Eng. Marko Stokić

University of Belgrade
Faculty of transport and traffic engineering



INTRODUCTION

- Transport and logistics companies
- Own vehicle fleet
- Main goal = profit
- Transport process → primary process
- Maintenance process → secondary process
- Before
 - Maintenance = „necessary evil“
- Today
 - Maintenance = „value adding“
- New methods, theories, concepts and approaches

A CONCEPT OVERVIEW

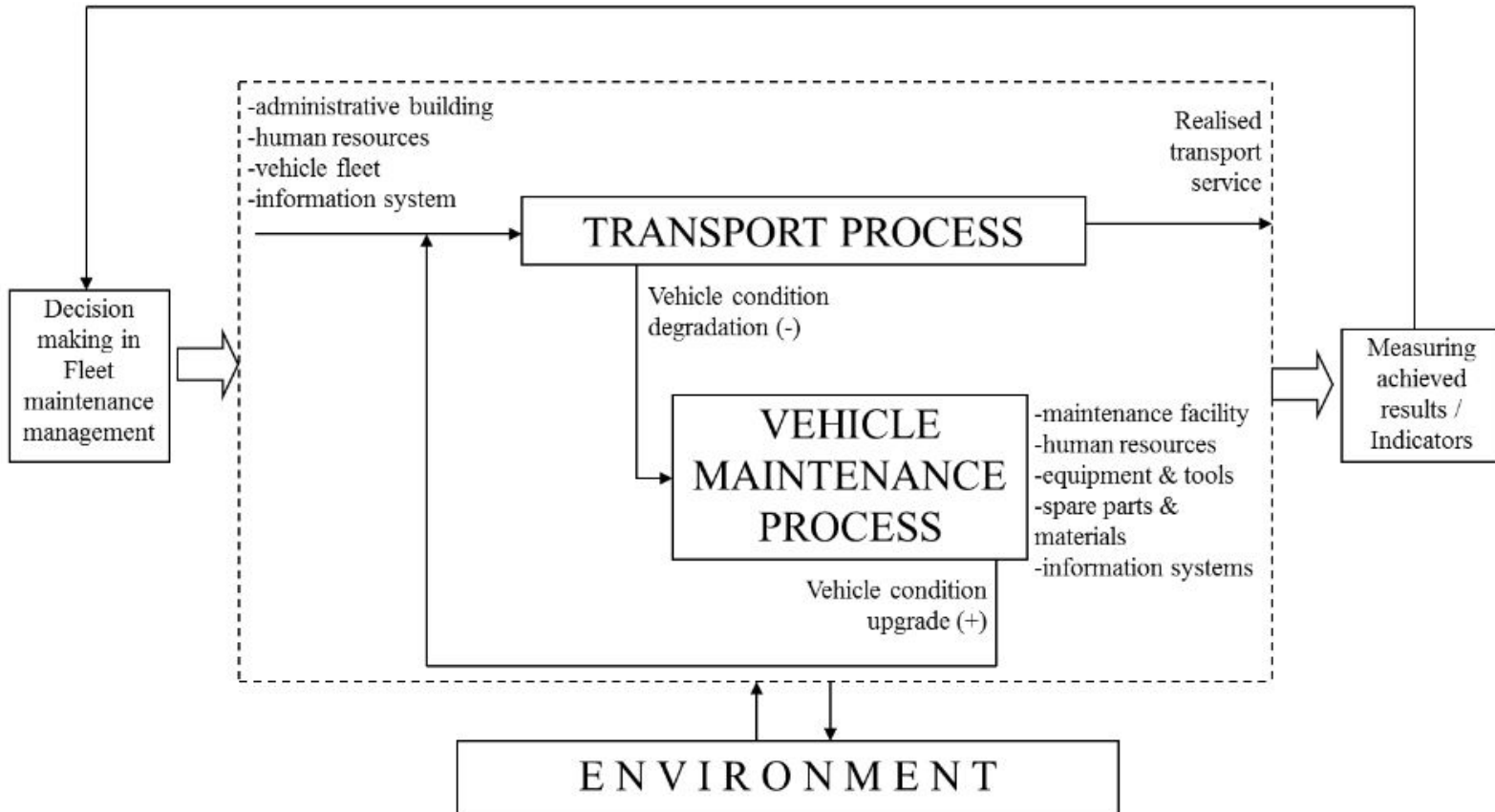
- Concept basic principles
- Harmonize & integrate
- Transport process (TP)
- Maintenance process (MP)
- Industrial devices and machines vs vehicles
- Environment
- In order to effectively manage fleet maintenance, it is necessary for managers to coordinate and integrate:
 - Transport process **(TP)**
 - Vehicle maintenance process **(VMP)**
 - Environment **(E)**

INTEGRATED VEHICLE FLEET MANAGEMENT

- Implementation of measures, actions, decision making
- Reduce overall
 - Transport costs
 - Maintenance costs
 - And to increase energy efficiency
- Three interdependent components:
 - Transport
 - Maintenance
 - Environment

INTEGRATION

- Transport process (TP)
- Vehicle maintenance process (VMP)
- Environment (E)

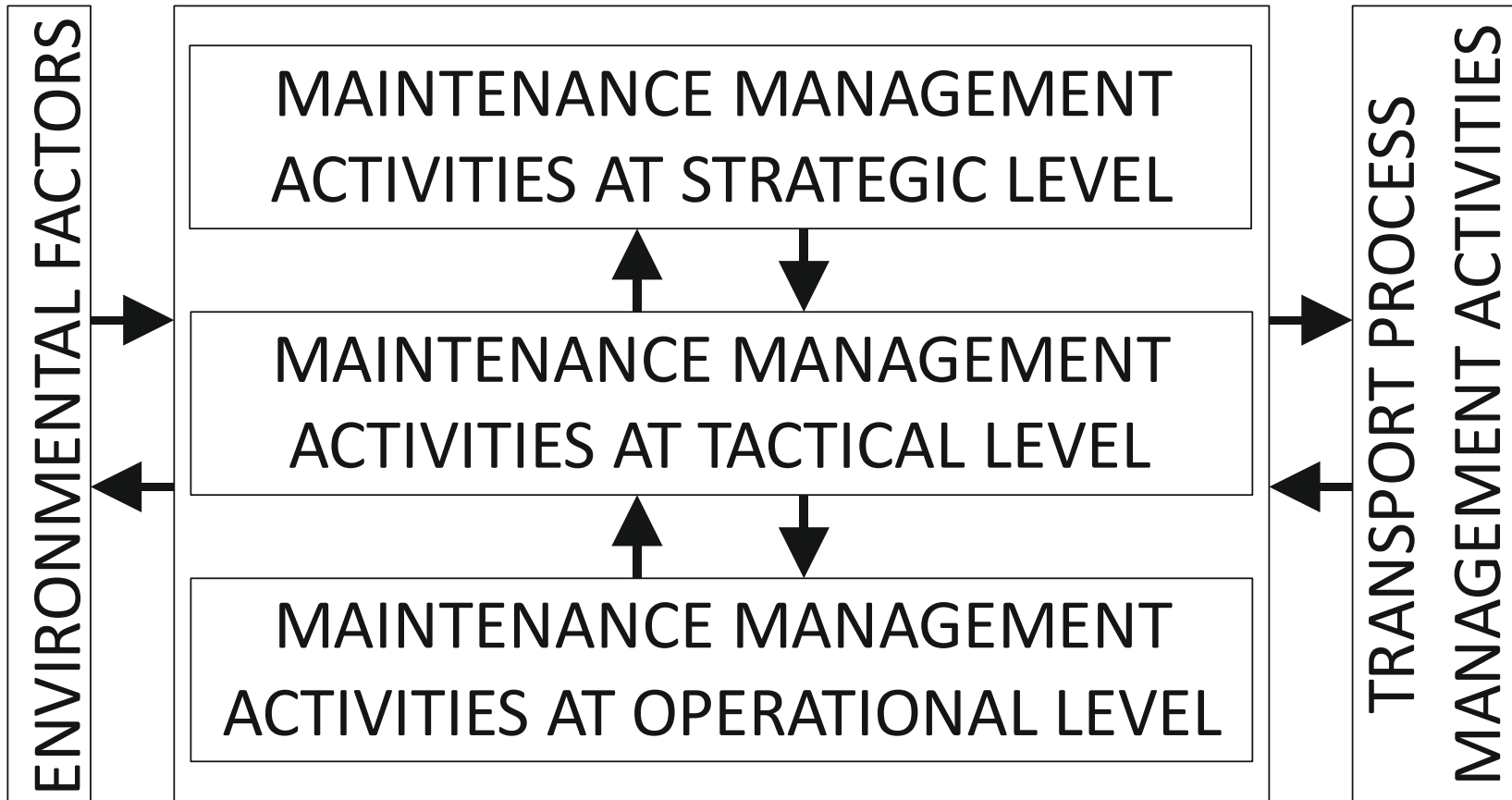


COMPREHENSIVE VEHICLE FLEET MANAGEMENT

- Implementation of management activities
- Mutually dependent management levels
 - Strategic
 - Tactical
 - Operational
- In accordance with:
 - Basic activities of the TP management
 - Environmental factors
- In order to achieve → defined goals of the companies

COMPREHENSIVE COMPLIANCE

- Vehicle fleet maintenance management activities



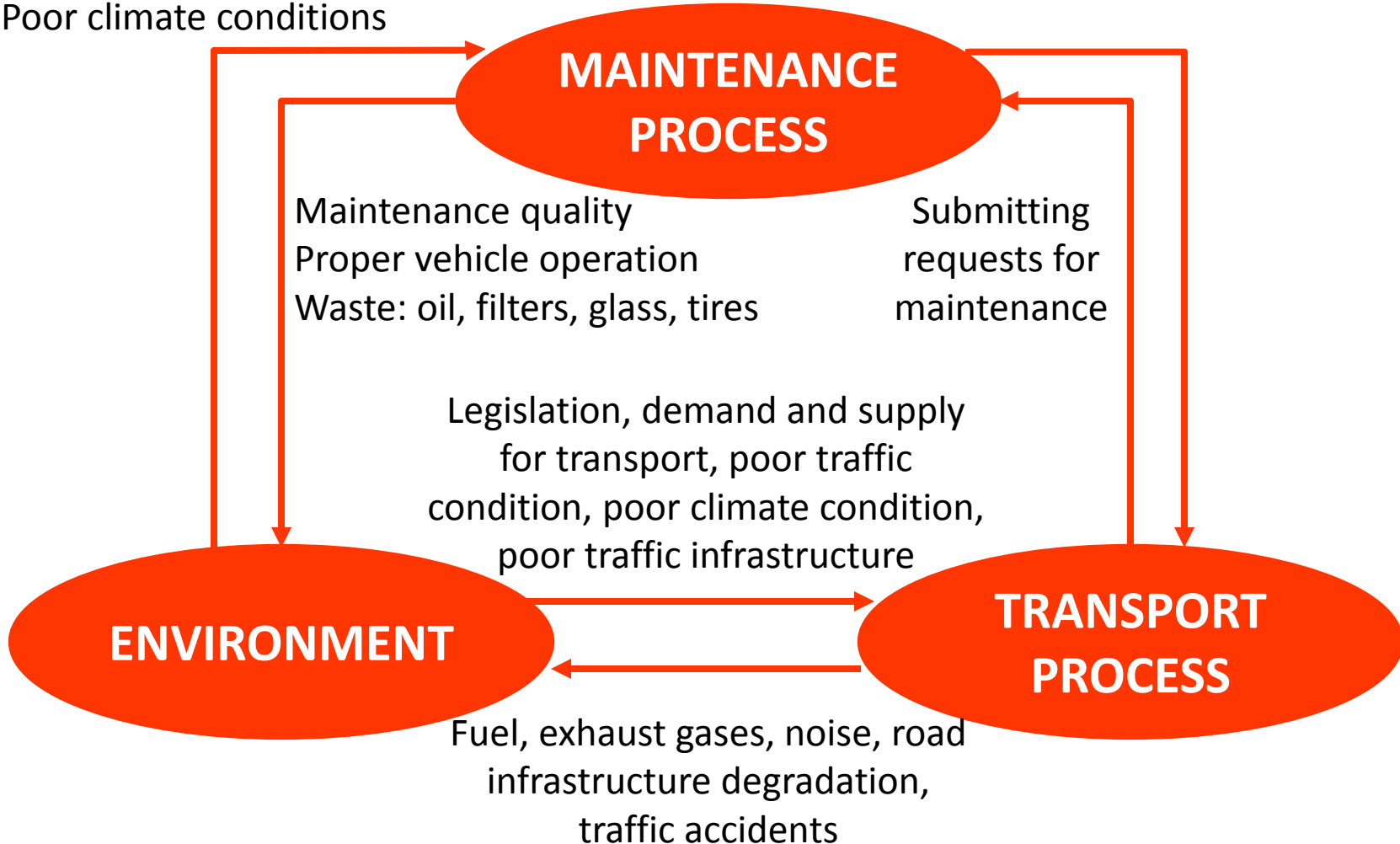
COMPREHENSIVE INTEGRATED VEHICLE FLEET MANAGEMENT

- Main objective
 - enable transport managers to dispose with vehicles from the most suitable CO group for the realization of current transport tasks, in the necessary time periods, according to the transport process and environmental requirements
- According to the comprehensive integrated vehicle fleet maintenance management, there are interdependent effects between:
 - Transport process
 - Vehicle maintenance process
 - Environment

INTERDEPENDENT EFFECTS

Vehicle manufacturer recommendations
Vehicle seller terms
Characteristics of service centers
Poor climate conditions

Vehicle unavailable for work
Improper maintenance –
reduced transport service quality



CRITERIA FOR INTEGRATED VEHICLE FLEET MAINTENANCE MANAGEMENT

$$A_o^k(t) \geq A_r^k(t) \quad D_{no}^k(t) \geq A_{no}^k(t)$$

$A_o^k(t)$ Current number of operational vehicles (“ready for operation”) from kth CO group

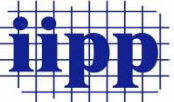
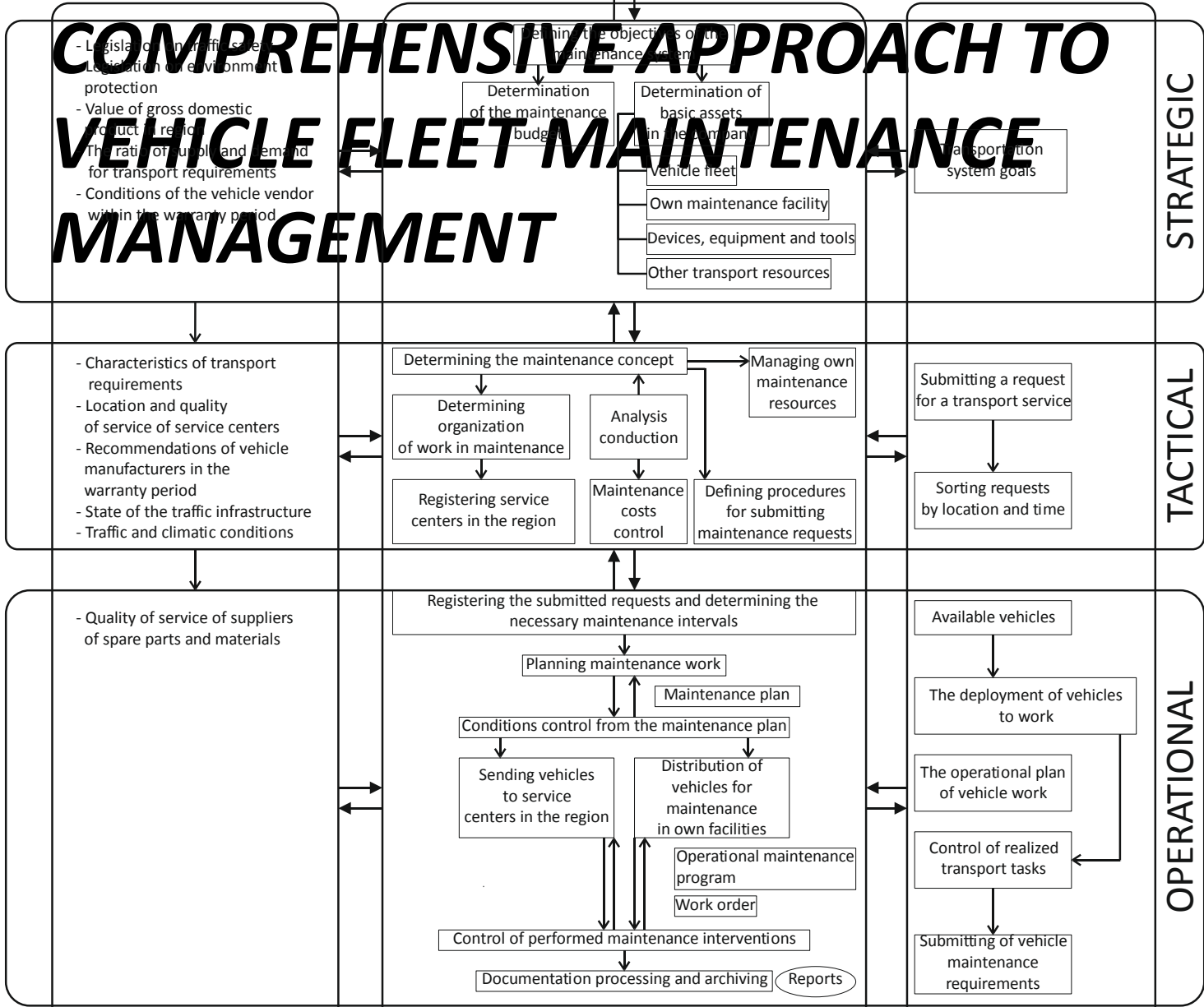
$A_r^k(t)$ Required number of vehicles for operation from kth CO group

$D_{no}^k(t)$ Allowed number of non-operational vehicles from kth CO group

$A_{no}^k(t)$ Current number of non-operational vehicles (“unready for operation”) from kth CO group

COMPANY GOALS

COMPREHENSIVE APPROACH TO VEHICLE FLEET MAINTENANCE MANAGEMENT

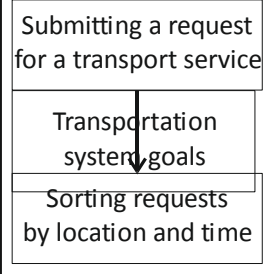
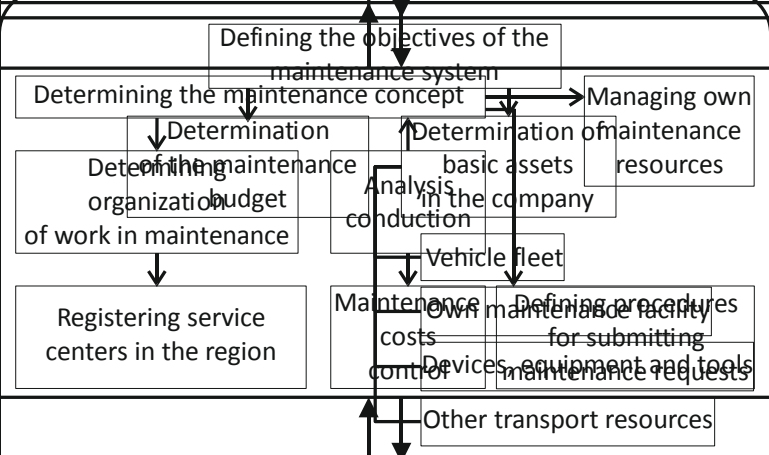


COMPANY GOALS

Own maintenance facility
 Devices, equipment and tools
 Other transport resources

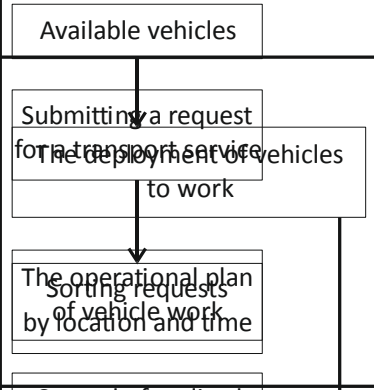
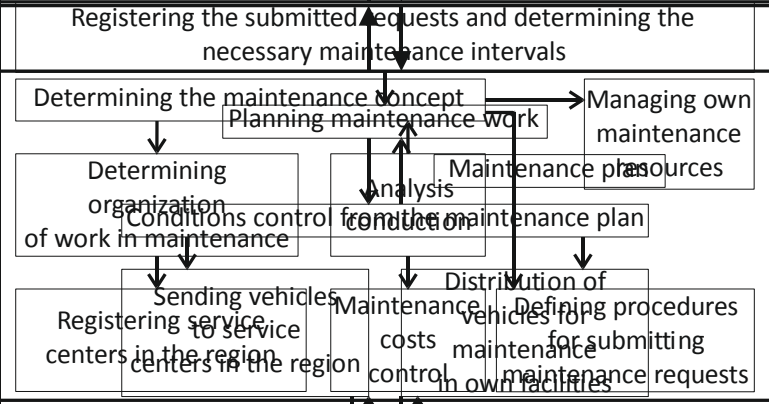
STR

- Legislation on traffic safety
- Legislation on environment protection requirements
- Characteristics of transport requirements
- Value of gross domestic product in region
- Location and quality of service centers
- The ratio of supply and demand for transport requirements
- Recommendations of vehicle manufacturers in the warranty period
- Conditions of the vehicle vendor within the warranty period
- State of the traffic infrastructure
- Traffic and climatic conditions



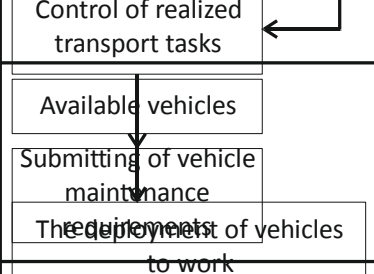
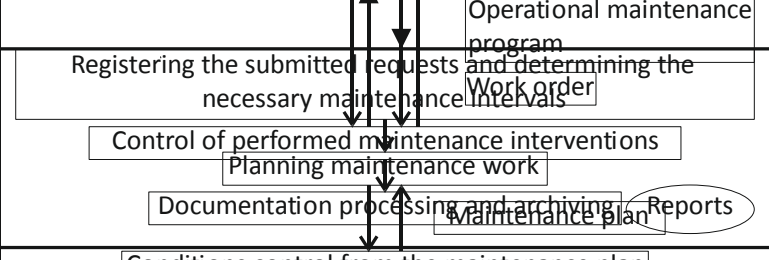
STRATEGICAL

- Quality of service of suppliers of spare parts and materials
- Characteristics of transport requirements
- Location and quality of service of service centers
- Recommendations of vehicle manufacturers in the warranty period
- State of the traffic infrastructure
- Traffic and climatic conditions



OPERATIONAL

- Quality of service of suppliers of spare parts and materials



OPERATIONAL

ENVIRONMENT

MAINTENANCE PROCESS

TRANSPORT PROCESS

EXPECTED RESULTS OF THE DEVELOPED CONCEPT APPLICATION

- Reduce transportation costs
- Reduce maintenance costs
- Increase vehicle fleet energy efficiency
- Reduce number of „backup“ vehicles
- Increase OP performance
- Reduce vehicle maintenance disorders

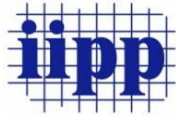
EXPECTED RESULTS OF THE DEVELOPED CONCEPT APPLICATION

- Implementation of one part of proposed concept
- Feb – July 2016
- Serbian company with own vehicle fleet
- 33 vehicles
- Most represented – vans with total allowable weight of up to 3.500 kg

Observed period and improvement achieved	February, 2016.	July, 2016.
Vehicle capacity utilization (%)	17,1	20,4
Specific fuel consumption per transport volume (lit/100tkm)	33,9	28,1
Necessary number of vehicles for carrying out transport tasks	27	27
Total number of vehicles	33	31

CONCLUSION

- Comprehensive integrated vehicle fleet maintenance management
- Interdependent influences between MP, TP & E
- Strategic, tactical & operational maintenance management activities
- Application on transport company
- Fuel consumption was improved by 17,1%
- Vehicle size was reduced by 6,1%
- Transport process requirements remained unchanged
- Lower maintenance and transport costs
- Directions of future research



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THANK YOU FOR YOUR ATTENTION !

QUESTIONS ?

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