OCENA I POBOLJŠANJE ODRŽAVANJA GRADSKIH ULICA: STUDIJA SLUČAJA KRAGUJEVAC
ASSESSMENT AND IMPROVEMENT OF URBAN STREETS MAINTENANCE: CASE STUDY KRAGUJEVAC

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1 UVOD

Agencije za puteve godinama su se suočavale s raznim problemima prilikom održavanja putnih infrastrukturnih sistema u ispravnom stanju, korišćenjem tradicionalnih metoda ugovaranja. Kao rešenje ovih problema, mnoge od njih su počele da zaključuju ugovore o radovima na održavanju puteva s privatnim sektorom, na osnovu merenja učinka [1–4]. Osnova za ovakav ugovor jeste konkretni opis željenog proizvoda, pri čemu investitor plaća izvođaču odgovarajuću naknadu za obezbeđivanje proizvoda koji zadovoljava postavljene standarde. Ne obavlja se merenje stvarnih radova koje obavi izvođač, i investitor ne zanima šta izvođač radi, već samo da li konkretni proizvod ima odgovarajuće karakteristike kada su u pitanju funkcionalnost i kvalitet. Ova metoda ugovaranja zove se ugovaranje na osnovu učinka (eng. Performance Based Maintenance [PBM]). Ova metoda smatra se isplativijom od drugih, tradicionalnih metoda ugovaranja i poseduje značajnu istoriju uspešnih pokušaja u mnogim razvijenim zemljama i zemljama u razvoju u poslednje dve decenije [1–5].

Tradicionalne metode ugovora o održavanju puteva zavise od količine obavljenih radova i agencija za puteve plaća izvođača na osnovu prethodno dogovorenih jediničnih cena. S druge strane, PBM ugovori (PBMCs) za putne infrastrukturne sisteme zasnivaju se na rezultatima rada izvođača i plaćanje se vrši na osnovu mogućnosti izvođača da dostigne standard učinka – definisan ugovorom, a ne na osnovu količine izvršenih

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1 INTRODUCTION

For years, road authorities faced with number of problems when using traditional contracting methods for maintenance of serviceability of road infrastructure systems. As a solution to these problems, many of them started contracting out road maintenance works to the private sector, based on a measured performance [1–4]. Basically, the contract provides the specific description of the required product whereby the employer pays the contractor adequate compensation for providing the product that complies with the required standards. The actual work done by the contractor is not measured, and the employer is not concerned with contractor’s work procedures - only with the specific functional and quality characteristics of the delivered product. This contracting method is known as Performance Based Maintenance (PBM) contracting. It is considered to be more cost effective than the other traditional methods of contracting. It had a substantial success records in many developed and developing countries over the last two decades [1–5].

Traditional methods of road maintenance contracts depend on the amount of work executed and contractors are paid by the road authority based on the previously agreed unit rates. On the other hand, PBM Contracts (PBMCs) for road infrastructure systems are based on the outcome of contractors’ work and payments are made subject to contractors’ ability to achieve the performance level defined in the contract, and not on the quantity of works executed. PBMCs define final product

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and it is up to the contractor how to achieve this. Therefore, selection of work method, design and delivery are entirely contractor’s responsibility. Hence, the selection and application of technology and the pursuit of innovative materials, processes and management is entirely up to the contractor. This allocates almost complete risk to the contractor unlike the traditional contract arrangements, but at the same time opens up the opportunities for the contractor to increase his margins, where improved efficiencies and effectiveness of design, process, technology or management can significantly reduce the cost of achieving the specified performance standards [1].

Even though the PBM concept has been widely used in the road maintenance practice, there is a significantly lower experience with applying this concept to urban streets under the jurisdiction of local authorities. Republic of Serbia (RS) has a positive experience with the PBMCs [5], but only for state roads on a pilot basis between 2004 and 2008. Lately, this resulted in launching the PBMC procurement for approximately 3,000 km of state roads network in Eastern Serbia. There has been no experience of PBMC implementation at the level of local roads network yet.

With the goal to improve the current practice and condition of urban network, the study [6] specifically related to the use of Performance Based Contracts (PBCs) for maintenance of the City of Kragujevac road network has been conducted, covering legal and technical assessment, market sounding and capacity needs.

2 CURRENT CONDITIONS AND PRACTICE IN Kragujevac

Kragujevac [7] is the fourth largest city in Serbia, with population of approximately 180,500 individuals, and a projected future conurbation of up to 220,000 by 2020. The urban population accounts for about 153,500 individuals and the rural about 27,000. The City is situated 140 km to the south of Serbian capital Belgrade and connects to the capital by Pan-European Corridor 10 highway.

It comprises of 5 municipalities with 57 settlements and 76 local communities. This 19th century capital of Serbia (1818-1841) was an important industrial and trading centre of the country, and it is today the administrative centre of Śumadija District. Kragujevac is one of the Serbian university centres. University of Kragujevac was established in 1976 and is comprised of 11 faculties that have vibrant scientific and research activities.

During the 19th century many first state institutions - judicial, educational, cultural, industrial and apothecary - were established here (Court, National Office, Grammar and High School Lyceum, Serbian Majestic Orchestra, Court Theatre, Cannon Foundry, Electric Power Plant, Pharmacy). At that time the foundations of the modern city life were laid. In the 20th century the city experienced fierce devastation and casualties during the First and Second World Wars, but demographical and industrial boost followed. Today Kragujevac is best known for its car and army industry, but these have also been struggling with fierce economic conditions and lack of market.
2.1 Network

The latest planning document adopted for the City of Kragujevac (Strategy of Sustainable Development of the City of Kragujevac 2013-2018 [8]) reports the network of approximately 430 km, as presented in Table 1. According to the latest data, municipal roads account for 70.7% of the total categorized road network. Out of this, 82.6% are with modern pavement structure.

Table 1. Length and pavement type for categorized road network of the City of Kragujevac [8]

| Kategorija puta | Dužina prema tipu kolovoza [km] | Ukupno / Total |
|-----------------|---------------------------------|----------------|
|                 | Modern | Makadam/šljunak | Zemlja | km | % |
| Državni put I kategorije | 74,0 | 0 | 0 | 74,0 | 17,2 |
| Državni put II kategorije | 52,0 | 0 | 0 | 52,0 | 12,1 |
| Lokalni putevi | 251,65 | 50,75 | 2,1 | 304,5 | 70,7 |
| Ukupno / Total | 377,65 | 50,75 | 2,1 | 430,5 | 100,0 |

Street network basically consists of radial infrastructure that directly guides state roads (1st and 2nd category) to the City (Figure 1). According to the functional classification of streets, these are highest ranked streets that correspond to their position in the local network of streets and traffic loads they carry. The network of secondary and local importance is generally of orthogonal type with orientation in the northwest-southeast and northeast-southwest direction. Functional categories of streets are presented in Table 2. Total length of core street network is 62.8 km (arterial and main streets), while total length of categorized street network is 94.2 km. This is further enlarged by the network of local categorized roads to total approximately 400 km. There are also about 1,000 km of uncategorized roads, 100 km of which with modern pavement.

Table 2. Division of street network [9]

| Kategorija ulica | Dužina [km] | Širina profila [m] |
|------------------|-------------|-------------------|
| Arterije | 34,9 | 10 - 25 |
| Glavne ulice | 27,9 | 9 - 22 |
| Sabirne ulice | 31,4 | 9 - 22 |
| Ukupno / Total | 942 |
2.2 Management and Maintenance Practice

City authorities, having particular role in management of streets and roads, and supervision of activities within the City limits are [10]:

− City Administration for Investments and  
− City Administration for Communal and Inspection Affairs.

City Administration for Investments takes care of all roads uncovered by the General Urban Plan (GUP), as well as of all uncategorized roads within the GUP boundaries. On the other side, City Administration for Communal and Inspection Affairs has jurisdiction over the categorized local roads and streets within the boundaries of the GUP. In order to implement their management duties, they sign the annual contracts for maintenance of the named roads with the selected contractors.

It is evident that there is a dual approach to management and supervision of maintenance activities related to streets and roads network within the City of Kragujevac. It seems that there is a well-defined divided jurisdiction between these two City administration offices. On the other side, this may also present obstacle for introducing wide area PBMC that should encourage competition and attract stronger contractors, but may also govern decision about the scope of PBMC regarding selection of streets and roads that should be included in the contract(s) (e.g. one contract covering roads within the GUP and the other one outside the GUP).

City of Kragujevac is faced with limited funds for maintenance of roads. Ove the past years, City was able...
zaostatkom), dok je periodično održavanje, rekonstrukciju i izgradnju deonica državnih puteva obično finansiralo Javno preduzeće „Putevi Srbije” i u donekle međunarodne finansijske institucije (eng. *International Financial Institution* [IFI]). Bilo je i nekih radova na izgradnji i rekonstrukciji ulica, lokalnih puteva, kao i mreže nekategorizovanih puteva koji su finansirani iz gradskog budžeta. Ovo je realizovano u veoma malom obimu i vrlo sporo. Neki od ovih projekata čak nisu ni završeni. Konstatiše se da je kapacitet grada trenutno dovoljan da pokrije samo oko 10% neophodnog godišnjeg nivoa kapitalnog ulaganja.

Ulice i putevi u gradu Kragujevcu održavaju se na osnovu godišnjeg programa održavanja komunalne infrastruktura. Program uređuje održavanje komunalne infrastruktura, obim i količinu aktivnosti održavanja i finansijska sredstva neophodna za njegovu realizaciju. Program se realizuje putem ugovora s javnim komunalnim preduzećima (JKP) ili drugim kompanijama (obično iz privatnog sektora). Takođe, definiše uloge uključenih stručnih sastavnih elemenata održavanja ulica, lokalnih i nekategorizovanih puteva.

Aktivnosti koje se tipično svrstavaju u održavanje puteva i ulica podeljene su između nekoliko izvođača u zavisnosti od stručnosti u okviru različitih JKP. Postoje i neke neobičnjene podele poslova (npr. jedna kompanija održava kolovoz i troboje – JKP „Čistoća”, a druga vodi računa o saobraćajnoj signalizaciji i uličnoj opremi – JKP „Parking servis Kragujevac”). Program definiše tipove aktivnosti održavanja komunalne infrastruktura od koji se dve stavke odnose na redovno i zimsko održavanje ulica. Ostale stavke sadrže aktivnosti koje obuhvataju preostale elemente poprečnog profila (kolozojava i saobraćajna signalizacija i oprema). Program održavanja trebao bi da je pripremljen u skladu s postojećom klasifikacijom ulica.

Za održavanje svih ulica i puteva, u proteklim nekoliko godina, bilo je potrebno približno dva i po miliona evra. Ako pogledamo iznose za ulice u okviru GUP-a, one se kreću između 1 i 1,9 miliona evra. Kompletni ovaj iznos ne potroši se stvarno i to uglavnom zavisí od sredstava u gradskom budžetu. Postoji značajna nejednačenost dostupnih budžetskih sredstava za proteklih godinama. Kratak i krajinje opšta viziuzala procena stanja ulica u okviru grada pokazuje to da su obezbeđena sredstva daleko niža od dovoljnih za održavanje vrednosti imovine.

U 2014. godini, Skupština grada Kragujevac usvojila je Odluku o ulicama, lokalnim i nekategorizanim putevima [11], ali specifična lista ulica, lokalnih i nekategorizanih puteva, sa relevantnim podacima koji opisuju barem dužine i poprečne profile, nije definisana. Osim toga, nijedna strana od onih uključenih u upravljanje i/ili održavanje puteva (npr. gradska uprava, izvođači) ne prikupljaju podatke o inventaru i stanju ulica, lokalnih i nekategorizovanih puteva.

U stvarnosti, gradske vlasti dodeljuju aktivnosti (ne samo one koje se odnose na ulice i puteve, već uopšte) u zavisnosti od raspoloživih sredstava doznacenih od države na lokalni budžet, što se obično ne dešava u redovnim intervallim. Ovo se čak pogorsava s činjenicom da nikad nije bilo izvršenog planiranja aktivnosti. Prema informacijama kojima raspolaga gradska uprava, iznos namenjen za održavanje ulica i puteva u programu održavanja komunalne infrastrukture to finance only routine and winter road maintenance (even these with significant backlog of activities), while periodic maintenance, reconstruction and construction of state roads’ sections were usually financed by Public Enterprise „Roads of Serbia" and to a certain amount by International Financing Institutions (IFIs). There were some construction and reconstruction works on streets, local roads, as well as on uncategorized road network financed from the City budget. This was implemented at a very low rate and with slow progress. Some of these projects were not even completed. It is being said that the City’s capacity at the moment is sufficient to cover only about 10% of necessary capital investments annually.

Maintenance of streets and roads in the City of Kragujevac is performed on the basis of Annual Program of Communal Infrastructure Maintenance. The Program arranges maintenance of communal infrastructure, scope and volume of maintenance activities and financial resources necessary for its implementation. The Program is implemented through contracts with Public Utility Companies (PUCs) or other companies (normally from the private sector). It also defines roles of all the parties involved (city authorities, contractors, supervision service). Activities typically falling under the maintenance of roads and streets are divided among several contractors in relation to the likely available specialization within the PUCs. There is also some unusual division of tasks (e.g. one company maintains pavements and sidewalks - PUC „Čistoća", and the other takes care of traffic signalization and equipment of streets - PUC “Parking servis Kragujevac”). The Program defines types of communal infrastructure maintenance activities out of which two line items are related to routine and winter maintenance of streets. Other items contain activities related to the remaining elements of a cross section beside pavement and to the traffic signalization and equipment. Program of streets maintenance is said to be prepared in accordance with the existing streets classification.

The funds intended for maintenance of all streets and roads amounted approximately EUR 2.5 million in the past several years. Looking at the figures for streets within GUP only, this amount ranges between EUR 1 and 1.9 million. Not all of this amount is actually spent and this mostly depends on availability of resources in the City budget. There is significant inconsistency of available budgetary resources for the past years. The brief and very general visual assessment of streets condition within the city clearly shows that the amounts allocated are far from being sufficient to maintain the asset value.

In 2014, City Assembly adopted Decision on Streets, Local and Uncategorized Roads [11], but the specific list of streets, local and un categorized roads, with relevant data describing at least lengths and cross section profile, was undefined. Likewise, none of the parties involved in management and/or maintenance of roads (City authorities, contractors, etc.) collect data on inventory and condition of streets, local and uncategorized roads.

In reality, City authorities assign the activities (not only those related to streets and roads, but in general) to available resources transferred from the state to local budget, which usually fails to happen in regular intervals. This gets even worse with the fact that planning of
activities has never been undertaken. According to the information available from the City administration, the amount allocated for maintenance of streets and roads in the Program of Communal Infrastructure Maintenance is normally estimated on the basis of experience and this figure is generally mapped from year to year.

Road managers entrust the works on maintenance of streets, local and uncategorized roads to companies established by the City Assembly to perform these tasks or to other companies and entrepreneurs based on the Decision on Streets, Local and Uncategorized Roads [11]. Operationally, the complete routine and winter maintenance is being performed by PUC “Čistoća” for both areas (within or outside the boundaries of the GUP). The works are entrusted to PUC “Čistoća” on the basis of the Law on Communal Services [12], Law on Public Procurement [13] and several decisions [11, 14–17] rendered by the Assembly of the City of Kragujevac on contracting and entrusting of communal services that allow direct contracting with PUCs.

Works are performed until all financial resources are spent. Luckily, up to now there has been no case that resources were spent until winter service or during the last 2-2.5 months of the year. This was mainly because the planning was done on an empirical basis (PUC “Čistoća” can be considered as experienced contractor that learned the process over the years and adapted to available resources).

Traditional method-based contract is utilized specifying the processes, materials, and quantities, without setting time schedules for performance of maintenance works. The contract seems to be subject to very detailed directions by the City Administration. The payments are made on the basis of Bill of Quantities (BoQ) for specified works. Maintenance works are mainly restricted to those that are equal to reinstatement of “normal” conditions and contain a rather limited number of activities in accordance with the aforementioned Program of Communal Infrastructure Maintenance and relevant price list.

As usual, the contractor of road maintenance works is obliged to provide satisfactory evidence on quality of used materials and performed works, and supervisory body confirms compliance with specifications and/or instructions. Technical specifications do not exist, while description of works is defined through the Program of Communal Infrastructure Maintenance and price list that is attached to contract form. Monitoring and supervision of works by the City Administration is done in an ad-hoc manner with the primary purpose to verify that the reported works have been completed.
– predloženi okvir kvaliteta za obezbeđenje usaglašenosti radova.
– optimalna veličina i lokacija za svaki pojedinačni ugovor o održavanju mogu se zasnivati na parametrima kao što su:
  - lokacija;
  - kategorija / tip puta;
  - stanje puta;
  - obim saobraćaja;
  - kapacitet izvođača;
  - troškovi održavanja;
  - pristupačnost;
  - topografija.

3.1 Opseg primene i obim ugovora

Analiza postojeće prakse održavanja ulica i lokalnih puteva pokazuje dvostruki pristup – jedan ugovor za ulice i puteve u okviru GUP-a i drugi za one van granica GUP-a. Takođe, napominje se da su svi nekategorizani putevi unutar GUP-a trenuto uključeni u ugovor koji pokriva područje van granica GUP-a. Zbog toga, postoji logičan pristup izboru područja koje će biti pokriveno eventualnim PBMC-om, a pružavane su sledeće opcije:

(i) oblast unutar granica GUP-a;
(ii) oblast izvan granica GUP-a;
(iii) kompletna teritorija Grada Kragujevca.

Prve dve opcije potpuno su iste s postojećim stanjem, dok bi treća opcija predstavljala proširenje područja koje bi bilo pokriveno i može predstavljati značajnu prepreku za kapacitet lokalnih izvođača (iz javnog i privatnog sektora). Izbor područja treba da bude povezan i sa izborom puteva koje treba održavati.

Trenutno postoje praktično tri grupe ulica i puteva na teritoriji Grada Kragujevca:

(i) ulice (arterijske, glavne, sabirne) u prosečnoj dužini od 95 km, s predviđenim produženjem do približno 210 km do kraja perioda planiranog GUP-om [18];
(ii) lokalni kategorizirani putevi u približnoj dužini od 305 km;
(iii) lokalni nekategorizirani putevi u približnoj dužini od 1.000 km.

S obzirom na poznatu teritoriju i opšte stanje mreža ulica, priprema tenderske dokumentacije za PBMC i realizacija PBMC ugovora trebalo bi da budu lakše za opciju (i). Takođe, ne bi postojala pretnja da će JKP „Čistoča” odmah izgubiti znatan deo prometa u slučaju javnih nabavki, što bi im omogućilo da koncentrišu napore na svoje glavno područje delovanja. Međutim, i dalje treba da se prikupljaju podaci o inventaru i postojećem stanju.

Ako se izaberu opcije (ii) i (iii), pripremanje tenderske dokumentacije (narčito) i ugovora biće komplikovanije, jer je potrebno precizno definisanje liste puteva koji se održavaju i prikupljanje znatne količine podataka o inventaru i trenutnom stanju. Treća grupa lokalnih nekategoriziranih puteva uglavnom obuhvata prilazne puteve u ruralnom delu Grada Kragujevca, a oko 90% njegove dužine nema modernu kolovoznu konstrukciju. Stoga, ovo može zahtevati veliki trud izvođača u održavanju i verovatno neće dati relevantne rezultate za upoređivanje s drugim sličnim ugovorima u smislu kvaliteta puteva, rashoda, organizacije, i tako dalje.

3.1 Range of Application and Scope of Contract

Analysis of the existing practice in maintenance of streets and local roads shows dual approach, i.e. one contract for streets and roads within the GUP and another one for those outside the GUP boundaries. It is also noted that all uncategorized roads within the GUP are currently included in the contract that covers area outside GUP boundaries. Therefore, there is a logical approach to selection of area to be covered by the eventual PBMC, and the following options were studied:

(i) area within the GUP boundaries;
(ii) area outside of the GUP boundaries;
(iii) complete territory of the City of Kragujevac.

The first two options are exactly the same to the existing condition, while the third one would present enlargement of the area to be covered and may present a significant obstacle to the capacity of local contractors (both from the public and private sector). Selection of the area has to be connected also with selection of roads to be maintained.

Currently, there are practically three groups of streets and roads in the City of Kragujevac:

(i) streets (arterial, main, collector) in the approximate length of 95 km with the estimated extension to approximately 210 km by the end of GUP planning period [18];
(ii) local categorized roads in the approximate length of 305 km;
(iii) local uncategorized roads in the approximate length of 1,000 km.

Given the known territory and general condition of the street network, preparation of the PBMC bidding documents and PBMC contract implementation should be easier for the option (i). Also, there would be no threat that PUC “Čistoča” would immediately lose significant portion of turnover in case of public procurement, and this would also enable them to concentrate their efforts to their main field of activity. Still, there is a need to collect data on inventory and condition.

When the options (ii) and (iii) are selected, preparation of bidding documents (in particular) and contract are more complicated because there is a need to precisely define list of roads to be maintained and collect significant amount of information on inventory and condition. The third group of local uncategorized roads mostly comprises of access roads in the rural area of the City of Kragujevac and about 90% of its length is unpaved. Therefore, this may require significant effort.
3.2 Standardi održavanja i nivo usluge

Prilikom definisanja optimalnog nivoa usluge za svaku kategoriju puta, rad mora biti zasnovan na informacijama o trenutnom stanju, tipičnoj upotrebi puta i uobičajenim korisnicima, pristupačnosti. Različiti nivoi usluge mogu se primeniti na različite deonice puta, u zavisnosti od, na primer, nivoa saobraćaja, strukture saobraćaja, terena, stanja kolovoza, materijala i raspoloživog ugaročkog kapaciteta. Usvajanje jedinstvenog nivoa usluge za sve deonice ili nekoliko setova nivoa za različite puteve ili deonice puteva obično se razmatra u poslodavcem, uz pažljivu analizu ekonomske održivosti (minimalni troškovi prevoza) preporučenih nivoa usluge.

U ovom slučaju, definicija i izbor nivoa usluge uglavnom će zavisiti od stanja svake deonice puta koja će biti uključena u ugovor. Netako, kao što je slučaj i s Kragujevcem, lokalne vlasti ne prikupljaju redovno podatke o stanju, obimu saobraćaja, i imaju veoma zastarele podatke. Stoga, nije moguće izvršiti relevantnu ekonomsku procenu da bi se uspostavio nivo usluge za svaku kategoriju ulice/puta. Zbog toga je pripremljen okvir sistema koji predviđa pet različitih nivoa održavanja (standardi održavanja – MS), s obzirom na pet različitih nivoa usluge. Sistem se zasniva na funkcionalnoj kategorizaciji ulica i puteva u Kragujevcu, a uključuje i granične obime saobraćaja (tabela 3).

3.2 Maintenance Standards and the Level of Service

When defining the optimal Level of Service (LoS) for each type of road category, the exercise has to be based on the condition information, typical road uses and road user, affordability. Different LoS can be applied to different road sections depending on traffic levels, traffic structure, terrain, pavement condition, materials and contracting capacity available, etc. Whether uniform LoS for all sections will be adopted or several sets of levels for different roads or road sections is normally subject to discussion with the contracting authority and careful analysis of economic viability (minimum transport costs) of recommended LoS.

In this case, definition and selection of LoS will mainly depend on condition of each road section to be included in contract. It is common, and the case is same with the City of Kragujevac, that local authorities do not ordinarily collect information on condition, traffic levels, or even general inventory, or the information they have are very outdated. Therefore, it was not possible to perform relevant economic evaluation in order to establish LoS for each street/road category. For this reason, the outline of the system which envisions five different levels of maintenance (Maintenance Standards-MS) considering also five different LoS has been prepared. The system is based on functional categorization of streets and roads in the City of Kragujevac, including also the traffic volume thresholds (Table 3).
Nivo usluge koji pruža određeni standard održavanja biće niži na ulici/putu višeg funkcionalnog ranga, ali veći na putu s nižim saobraćajnim opterećenjem. Redovno održavanje podrazumeva izvršenje određene serije zadataka, osmišljenih da obezbede to da se svaka ulica

The LoS provided by a specific MS will be lower on a street/road of higher functional type and will be higher on a road of lower traffic class. Routine maintenance involves the execution of a specific series of tasks designed to ensure that each street/road is maintained.
3.3 Ugovor

Na osnovu analize postojećeg sistema ugovaranja održavanja puteva u Kragujevcu, kao i iskustava u drugim sličnim zemljama, predlaže se obrazac višegodišnjeg ugovora o održavanju puteva koji obuhvata određene kriterijuma učinka koji će se zasnivati na jediničnim troškovima i nivou usluge u zavisnosti od kategorije puta („hibridni“ model ugovora). Neke usluge se plaćaju na osnovu merenja korištenjem jediničnih cena, dok su druge povezane sa zadovoljenjem kriterijuma učinka i plaćaju se u jednim ratama za vreme trajanja ugovora.

Ovo pretpostavlja sledeće načine plaćanja:
- PS – paušalna suma (plaća se u određenom broju jednakih rata);
- JC – jedinična cena.

Novi ugovor treba da obuhvati:
- redovno održavanje odabranih kategorisanih ulica (arterije, glavne, sabirne) unutar granica GUP-a, na osnovu definisanih nivoa usluge i kriterijuma učinka;
- zimsko održavanje odabranih kategorisanih ulica (arterije, glavne, sabirne) unutar granica GUP-a u skladu s postojećom praksom zimskog održavanja, na osnovu definisanih nivoa usluge i kriterijuma učinka;
- vanredni radovi na odabranim kategorizovanim ulicama (arterije, glavne, sabirne) unutar granica GUP-a na osnovu posebnog predmeta i predračuna za svaki slučaj vanrednog stanja ili događaja.

Predviđa se da pilot-PBMC bude na period od tri godine. Ovo se smatra dovoljno dugim periodom za procenu učinka, sa obzirom na to što je ugovor u suštini samo za redovno održavanje. Tri godine će potencijalnim ponuđačima i gradskoj upravi dati šansu da se uhvate u koštac sa pojmom višegodišnjeg ugovora, bez vezivanja svih strana u dugoročnom formatu koji bi zahtevalo reviziju. Najvažnije, dugoročni (tri godine) pilot-„hibridni“ PBMC, s mogućnošću potencijalnog još dužeg kasnijeg punog PBMC (pet+ godina), povećava šanse za uspešan rast javnih i privatnih kompanija, budući da investitori generalno preferiraju dugoročnu stabilnost i poslovnu održivost za svoju investiciju.

UKupna procenjena vrednost pilot-PBMC-a od tri godine – za redovno i zimsko održavanje odabranog područja i obima radova – jeste tri i po ili četiri miliona evra (sa 20% nepredviđenih troškova).

Analizom postojećih ugovora, kao i programa održavanja komunalne infrastrukture i zvaničnog cenovnika, razvijena je lista aktivnosti održavanja predloženih u okviru „hibridnog“ PBMC-a. Ove aktivnosti pokrivaju u osnovi kompletan profil ulice (tj. kolovoz, sistem za odvodnjavanje, kosine, saobraćajna signalizacija i oprema, objekti, trotoari, pešačke staze, parkiralista, trgovii), kao i određene radove i usluge (snimanje inventara i stanja, zimsko i vanredno at its prescribed LoS. In general, the difference between MS lies in the frequency of execution or the permitted delay before execution of the required tasks rather than in the actual tasks themselves. Maintenance carried out to MS1 on an arterial street with traffic class 1, will provide a “Good” LoS; the same MS1 standard of maintenance on a main street having traffic class 1, will provide an “Excellent” LoS.

3.3 The Contract

Based on the analysis of existing road maintenance contracting system in the City of Kragujevac, as well as on the experience in other similar countries, the template of multi-annual road maintenance contract including some performance criteria that will be based on unit costs and LoS depending of the road category (“hybrid” contract model) is proposed. Compensation for some services is paid on the basis of measurement using unit prices, while others are linked to meet performance indicators and paid in equal instalments during the term of contract. This presumes the following methods of payment:
- LS - Lump Sum (to be paid in number of equal instalments);
- UP - Unit Price.

The new contract should cover:
- routine maintenance of selected categorized streets (arterial, main, collector) within the GUP boundaries on the basis of defined LoS and performance criteria;
- winter maintenance of selected categorized streets (arterial, main, collector) within the GUP boundaries in accordance with existing winter maintenance practice and on the basis of defined LoS and performance criteria;
- emergency works at selected categorized streets (arterial, main, collector) within the GUP boundaries on the basis of separate BoQ for each occurrence of emergency situation or event.

It is anticipated that the pilot PBMC will be for a period of three years. This is considered long enough for an assessment of performance, since the contract is essentially for routine maintenance only. Three years will give the eventual bidders and City Administration a chance to come to grips with the notion of the multi-annual contract without tying all parties into a longer term format which requires revision. Most importantly, longer term (three years) pilot “hybrid” PBMC, with prospect of potential even longer subsequent full PBMC (five+ years) would boost chances of successful growth of public and private companies, as investors generally prefer long-term stability and business viability for their investment.

Total estimated value of three years’ pilot PBMC for routine and winter maintenance of selected area and scope of works is EUR 3.5-4 million (with 20% contingencies).

Through the analysis of existing contracts, the Program of Communal Infrastructure Maintenance and official price list, the list of maintenance activities proposed to be performed within the scope of the “hybrid” PBMC has been developed. These activities cover basically complete profile of the street (i.e. carriageway, drainage facilities, slopes, traffic
održavanje). Predložene aktivnosti održavanja, kao i osnova za plaćanja, zavise od određene oblasti, zapravo, od vrste, obima i stanja ulične/putne imovine i mogu se ponovo preispisati i modifikovati od slučaj do slučaja. Oni takođe mogu biti predmet pregovaranja/do-govora sa odabranim izvođačem u slučaju postupka nabavke s direktnim pregovaranjem.

Predloženim aktivnostima održavanja treba takođe dodeliti neke parametre u pogledu učinka, koji se obično definišu tehničkim uslovima za radove održavanja. Iako se mogu pripremiti i koristiti kao opšti tehnički uslovi, ovo nije uobičajen slučaj u praksi održavanja na osnovu učinka. U stvari, prilikom pripreme svakog ugovora za koji se vrši nabavka, treba pregledati i prilagoditi određene uslove, prema potrebi, kako bi odrazili specifične zahteve određenog ugovora, u zavisnosti od stvarnog stanja ulica/puteva. Ipak, pripremljena je preliminarna lista pokazatelja učinka za sve identifikovane stavke radova (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4). Napominje se da su predloženi nivoi i pokazatelji učinka samo indikativni. U Kragujevcu treba sprovesti opšte prikupljanje podataka i precizno definisanje stanja mreže (tabela 4).
Nepostupanje u skladu s pokazateljima učinka ili popravke otkrivenog odstupanja u što kraćem roku ima negativan efekat na plaćanje izvođača, u suprotnom – imao je pravo u slučaju potpune usklađenosti s pokazateljima učinka. Dostizanje određenog broja kaznenih poena, u određenim okolnostima može da uzrokuje i raskid ugovora. Može se postaviti još jedan tip kriterijuma – da izvođač radova ima pravo na produženje ugovora ako se ne dostigne određeni broj kaznenih poena.

Pre nabavke radova i ugovaranja, Gradska uprava mora urediti inventar i prikupljanje podataka. Ona treba da:

(i) tačno odredi inventar koji treba ugovoriti (npr. ulice, putevi, dužine, elementi poprečnog profila, saobraćajna signalizacija i oprema);
(ii) tačno utvrdi stanje imovine koja se ugovara;
(iii) definira pokazatelje učinka u ugovoru;
(iv) izvrši preliminarnu procenu troškova;
(v) definira proces nadzora.

Da bi se ubrzao proces ugovaranja PBM-a i učinio se efikasnijim, ugovor se može direktno dodeliti putem pregovaračkog postupka sa izabranim JKP-om, u skladu sa odgovarajućim zakonima. Uvođenje pilotskih ugovora o održavanju na osnovu učinka za redovno i zimsko održavanje biće brže, jer se izbegava dugotrajna procedura nabavke, bez straha od neuspešnog postupka nabavke. Pri razmatranju ovog predloga, smatralo se da on nudi i najbolje šanse za uspešnu realizaciju pilot-programa zbog inicijalnog učešća izvođača radova i dogovorene priode konačnog ugovora. Međutim, sa sobom nosi problem da se ne bi ostvario cilj uvođenja održavanja na osnovu učinka u domenu konkurentnih tendera.

Predloženi pristup ima tendenciju da uspostavi jedinstvenu ravnotežu rizika između poslodavca (tj. grad Kragujevac) i izvođača, koristeći pristup „hibridnog“ ugovaranja održavanja na osnovu učinka za redovno i zimsko održavanje. Hibridni ugovor za redovno i zimsko održavanje kombinuje elemente klasičnih stavki po količini (stavke predmeta i predračuna) i jediničnih cena za plaćanje izmeñnih radova, sa elementima stvarnog učinka zasnovanog na pokazateljima.

Na taj način, različiti elementi s većim rizikom će se izvršavati putem predmeta i predračuna, a ne s jednostavnim paušalnim iznosom, i verovatno bi omogućili relativno „bezbojan“ prelazak s postojećeg načina ugovaranja za redovno održavanje. Time bi se nastavilo s prihvatljivim balansom rizika između poslodavca i ugovarača koji je već postignut putem postojećih ugovora koji se uglavnom zasnovaju na cenama i količinama iz predmeta i predračuna, krećući seprema punom ugovoru o održavanju na osnovu merenja učinka.

Bilo bi održivije i korisnije za kvalitet saobraćajne infrastrukture ukoliko bi izvođač bio specijalizovan bez obzira na to da li to dolazi iz privatnog ili javnog sektora. Ako je željena opcija gradskih vlasti da angažuju izvođače iz javnog sektora, predlaže se da se kreira JKP sa odgovarajućim kapacitetom za održavanje ulica i puteva. Ovaj kapacitet se može stvoriti preuzimanjem specijalizovanog osoblja i opreme iz postojećih JKP koji

Failure to comply with the performance indicators or to promptly rectify revealed deficiencies adversely affects the contractor’s payment through a series of clearly defined penalties. In case of non-compliance with performance indicators at specified inspection intervals, demerit points system introduces “negative” points for non-compliant contractors that will decrease amount of lump sum per km/month payment he would otherwise be entitled to in case of full compliance with performance indicators. Reaching certain number of demerit points may in particular circumstances lead to contract termination. Another type of criteria can be also set, i.e. the contractor shall be eligible for contract extension if he does not reach certain number of demerit points.

Prior to procurement of works and contracting, the City Administration has to arrange the inventory and collection of data. It needs to:

(i) accurately determine inventory to be contracted out (streets, roads, lengths, cross section elements, traffic signalization and equipment, etc.);
(ii) accurately determine condition of assets to be contracted out;
(iii) define performance indicators in the contract;
(iv) undertake preliminary cost estimates;
(v) specify a monitoring process.

To speed up the process of PBM contracting implementation and make the whole process more efficient, contract can be directly awarded through negotiated procedure with the selected PUC, in accordance with the relevant legislation. Introduction of pilot PBMcs for routine and winter maintenance will be faster avoiding lengthy procurement procedure, without fear of unsuccessful tendering. In considering this proposal, it was thought that it might also offer the best chance of a successfully implemented pilot because of the initial contractor participation and the agreed nature of the final contract. However, it carries with it the problem that it would not advance the aim of bringing PBM into the realm of competitive tendering.

Proposed approach tends to establish the uniform balance of risks between the employer (i.e. City of Kragujevac) and the contractor, by using a “hybrid” PBM contracting approach for routine and winter maintenance. A hybrid contract for routine and winter maintenance combines elements of “classic” quantity based items (BoQ items) and unit rates for payment of measured work, with elements of true performance-based indicators.

This way, various higher risk elements of the work will be done via BoQ format rather than plain lump sum and will hopefully facilitate relatively “painless” transition from the current contracting method for routine maintenance. It will continue with the acceptable balance of risks between the employer and the contractor already achieved through existing contracts mostly based on BoQ unit rates and quantities measurement, towards a full PBM.

It would be more sustainable and beneficial to quality of traffic infrastructure if the contractor would be a specialized one regardless of whether it comes from the private or public sector. If the preferred option by the City authorities is to employ public sector contractor, it is proposed to create PUC with the relevant capacity to maintain streets and roads. This capacity can be created
su već angažovani na održavanju ulica i puteva i njihovim daljim jačanjem u periodu od 2–3 godine. S takvim pristupom, grad bi kreirao zaista jedinstvene kapacitete za veoma specijalizovane službe pod vrlo specifičnim uslovima.

3.4 Akcioni plan

Prvi korak u realizaciji ugovaranja održavanja na osnovu merenja učinka treba da sadrži pilot-ugovor o održavanju na osnovu merenja učinka. Ovo proces treba da bude završen u tri faze, kao što sledi:

(i) izmena regulative (u trajanju od šest meseci od započinjanja aktivnosti);
(ii) priprema i faza ugovaranja (u trajanju od dvanaest meseci od započinjanja aktivnosti)
– izbor obima ugovora
– prikupljanje podataka o imovini
– razvoj pokazatelja učinka i učinka
– priprema konkursne dokumentacije
– nabavka i ugovaranje
– nabavka usluga tehničke pomoći;
(iii) faza realizacije (u trajanju od trideset šest meseci od završetka faze II)
– realizacija radova
– nadzor/nadgledanje
– merenje i plaćanje
– pomoć gradske administraciji
– ocena rezultata i identifikacija budućih koraka.

Nakon završetka pilot-projekta sa pozitivnim ishodima, gradske vlasti mogu da nastave sa realizacijom ugovora na osnovu merenja učinka koji pokriva istu oblast, ili čak da ga prošire tako da pokrije kompletnu teritoriju Kragujevca (oblasti unutar i izvan granica GUP-a).

Pored toga, gradske vlasti se mogu odlučiti da pokrene višegodišnji ugovor na bazi merenja učinka koji bi obuhvatio i redovno i periodično održavanje, tj. da nastave s „potpunim” ugovorom na osnovu merenja učinka. Ovakav ugovor donoši korist dodeljivanjem na takmičarskoj osnovi.

4 PRAVNA PROCENA

PBM ne može da funkcioniše u neodgovarajućem zakonodavno-pravnom okruženju. Mora postojati odgovarajući zakonski i budžetski okvir koji bi mogao da odgovori zahtevima ugovaranja PBM – prvenstveno dugog trajanja ugovora, odgovarajućih budžetskih obaveza u budućnosti i potrebe za uvođenjem ugovornih kazni zbog lošeg učinka ili neispunjavanja učinka.

Trenutno, nacionalno zakonodavstvo – pozivajući se na široko prihvaćene principe pravičnosti i transparentnosti – uvodi neke izuzetke koje u predmetnom slučaju, čak i nakon pažljive analize, ostavljaju nejasnoće i nelizvornost.

Dok – s jedne strane – svi važeći zakoni i podzakonski akti promovisu transparentnost i konkurentnost prilikom nabavke komunalnih usluga, svi izuzeći dozvoljavaju dvostruke standarde. Ovo se posebno odnosi na kašnjenje u popisu poslodavaca na

by overtaking specialized staff and equipment from the existing PUCs already engaged in maintenance of streets and roads, and their further strengthening in the period of 2-3 years. With such approach the City would create a really unique capacity for very specialized service in a very specific conditions.

3.4 Action Plan

The first step in implementation of PBM contracting should include pilot PBMC. The whole process should be accomplished in three phases, as follows:

(i) Legislation amendment (in duration of six months from the commencement of the activities);
(ii) Preparation and contracting phase (in duration of twelve months from the commencement of the activities)
– selection of contract scope
– asset data collection
– development of performance requirements and specifications
– preparation of bidding documents
– procurement and contracting
– procurement of technical assistance services;
(iii) Implementation phase (in duration of thirty-six months from the completion of phase II)
– implementation of works
– supervision/monitoring
– measurement and payment
– providing assistance to City Administration
– evaluation of results and identification of future steps.

Upon the completion of the pilot project with positive outcomes, City authorities may continue PBMC implementation covering the same area, or even expanding it to cover complete territory of the City of Kragujevac (both areas within and outside the boundaries of the GUP). Furthermore, City authorities may also decide to launch multi-annual PBMC covering both routine and periodic maintenance, i.e. to continue with “full” PBMC. Such contract would benefit from being awarded on the competitive basis.

4 LEGAL ASSESSMENT

PBM contracting cannot operate in an unsuitable legislative and regulatory environment. There must be an appropriate legal and budgetary framework in place to accommodate the requirements of PBM contracting — principally the lengthy contract durations, the corresponding forward budgetary commitments and the need to levy contractual penalties for poor performance or non-performance.

Current national legislation, while invoking broadly accepted principles of fairness and transparency, introduces some exceptions which in the case of the subject matter even after careful review allow for ambiguity and uncertainty.

Whilst on one hand all the applicable laws and bylaws promote the transparency and competitiveness during procurement of communal services, all the exceptions allow double standards. This is specifically
koje se ne primjenjuje Zakon o javnim nabavkama [13] i zamenjivanje nedostajuće liste pojedinačnim odlukama. 

S druge strane, višegodišnji ugovori ograničeni su na maksimalno tri godine [19] i nejasno je to da li PBMC mogu biti uspješno realizovani i da li mogu biti postignuti ciljevi u okviru tog ograničenog perioda u smislu „vrednosti za novac” i „ulaznih elemenata prema rezultatima”, bez realizacije predloženih promena u nacionalnom zakonodavstvu.

Ne postoji potreba da se predlažu izmene i dopune postojećeg regulatornog okvira kako bi se omogućilo isključivanje Zakona o javnim nabavkama [13] u slučaju finansiranja od strane međunarodnih finansijskih institucija. Ukoliko su potpisani sporazumi o zajmu, biće primenjiva relevantna konkursna dokumentacija i uslovi ugovora u njoj. U smislu nacionalnog zakonodavstva, uvođenje ugovora o PBM-u jeste radikalna transformacija i idealno bi bilo realizovati neke zakonske i proceduralne promene koje bi omogućile definisanje višegodišnjih ugovora sa osiguranim godišnjim plaćanjima za postizanje definisanog učinka. Trenutno, svaki godišnji budžet zavisi od dostupnih sredstava i odluka o relativnim prioritetima.

Mišljenje autora jeste da se s takvim sistemom ne mogu realizovati prednosti višegodišnjih PBMC-a. Preporučuje se da se pronadu pravna ili proceduralna sredstva koja pružaju izvođačima mnogo viši stepen sigurnosti u prihodima koji se mogu očekivati iz višegodišnjeg ugovora. Na primer, Ministarstvo finansija može usvojiti i objaviti unutrašnju politiku s ciljem ispunjavanja višegodišnjih ugovora sa fiksnom vrednošću do definisanog nivoa u svakom sektoru, ili samo u sektoru puteva, bez obzira na buduća budžetska ograničenja. Druga opcija s ciljem punog efekta rezultata PBMC-a bila bi da se utvrde takve izmene i dopune, kako bi se omogućilo zaključivanje višegodišnjih ugovora za period koji prelazi tekuci od tri godine.

Pored toga, radi povećanja konkurentnosti i efikasnosti usluga održavanja uopšte za primenu PBM ugovora, neophodno je obezbijediti bilo kakvo izuzeće Zakona o javnim nabavkama [7]. Ovo je izvodljivo ograničavanjem komunalnih usluga na listu usluga koje se mogu poveriti.

5 ISPITIVANJE TRŽIŠTA

Mora postojati adekvatan i voljan ugovarački kapacitet koji je na raspolaganju za realizaciju PBMC-a. Rad u okviru PBM okruženja sučava izvođače s novim iskustvom i izazovima; ne žele svi izvođači da uđu u ovog okruženja i od onih koji žele, nisu svi spremni da prihvate nove odgovornosti koje moraju da snose. 

Procjenjena je sposobnost i spremnost privatnih izvođača radova u regionu Kragujevac za sprovođenje redovnog održavanja uopšte, ali i prema PBMC Serni [8]. Pored toga, analiziran je i kapacitet izvođača u javnom sektoru.

Nijedno od preduzeća nema nikakva iskustva s PBM-om i to može da predstavlja najvažniji operativni rizik za realizaciju koncepta. Trenutno, čini se da su domaće kompanije (sudeći po njihovom tehničkom i finansijskom kapacitetu) sposobne da spravde ugovore o jednostavnom redovnom održavanju s nekim karakteristikama PBMC-a (zapravo, „hibrid” koji kombinuje svojstva ugovora prema merenju količina i related to delay in listing the contracting authorities to which the Law on Public Procurement [13] does not apply and substituting the missing list with individual decisions.

On the other hand, multi-annual contracts are limited to maximum three years [18] and it is unclear if the PBMCs can be successfully implemented and the goals achieved within this limited period in terms of “value for money” and “input against outputs”, without implementing proposed changes in national legislation.

There is no need to propose amendments to the current regulatory framework in order to allow exclusion of the Law on Public Procurement [13] in case of financing by IFIs. If loan agreements are signed the relevant bidding documents and conditions of contract therein agreed shall be applicable. In terms of national legislation, introduction of PBM contracting is a radical transformation, and would ideally require some legislative and procedural changes to allow multi-annual contracts to be written with assured annual payments for achievement of performance targets. At present each year’s budget is subject to availability of funds and decisions about relative priorities.

The opinion of the author is that the full benefits of multi-annual PBMCs cannot be realized with such a system. It is recommended that legal or procedural means be found to give contractors a much greater degree of certainty about the revenue they can expect from a multi-annual contract. For example, the Ministry of Finance might adopt and announce an internal policy to honour multi-annual fixed-payment contracts up to a defined ceiling in each sector, or in the roads sector alone, irrespective of future budgetary restrictions. Another option in order to give full effect to the results of PBMCs would be to develop such amendments to allow conclusion of multi-annual contracts for e period beyond the current limit of three years.

In addition, to enhance competitiveness and effectiveness of the maintenance services in general for application of PBM contracting any waiver of the Law on Public Procurement [7] should be discouraged. This could be done by limitation of communal services to a list of services which can be entrusted.

5 MARKET SOUNDING

There must be adequate and willing contracting capacity available to undertake the PBMCs. Operating within the PBM environment faces contractors with a new experience and challenges; not all contractors wish to enter this environment and of those that do, not all of them are willing to accept the new responsibilities which they must carry.

The ability and willingness of private contractors in the region of Kragujevac to carry out routine maintenance in general, but also under a PBMC scheme was assessed [8]. Furthermore, capacity of the public sector contractors has been also analysed.

None of the companies has any experience in PBM and this can present the most important operational risk for the implementation of the concept. At the moment it appears that local companies (judging from their technical and financial capacity) are capable to perform simple routine maintenance contracts with some features of PBMCs (actually “hybrid” one combining
Takode, značajno je napomenuti i to da se najveće vrednosti ugovora za privatne izvođače kreću od nekoliko stotina evra do više od milion evra, ali u proseku oko 0,5 miliona evra. Pod pretpostavkom da je reč o ugovorima s trajanjem tokom jedne građevinske sezone ili najviše godinu dana, može se zaključiti da domaće kompanije mogu konzumirati približnu vrednost godišnjeg ugovora u rasponu od 0,5 do 1,5 miliona evra. Ovo je ocenjeno kao dovoljno visoko da se određenu potrebu ugovaranja za održavanje puteva i ulica u Kragujevcu.

Jedino izrađeno preduzeće u javnom sektoru (JKP „Čistoća”) ima jedinstveno iskustvo u redovnom i zimskom održavanju na području Kragujevca. Ovo je udvostručeno s dostupnošću objekata širom grada. To je velika organizacija s vrlo ograničenom nezavisnošću, s obzirom na to što su u većinskom vlasništvu Grada Kragujevca i umnogome posluju putem direktnih ugovora koje dodeluje Grad Kragujevac. Takode, očigledno je to da je pružanje usluga održavanja ovog preduzeća više poput prinudnog rešenja u odsustvu relevantne specijalizacije unutar raspoloživih JKP-a, nego stvarna želja JKP „Čistoća” da obavlja ove radove (samo oko 11% prometa).

Obuka i jačanje kapaciteta koji poboljšavaju razumevanje privatnih ugovarača o strukturi PBMC-a mogu poboljšati učinak izvođača radova i povećati broj firma koje mogu da podnesu ponudu za ove ugovore. Takav pristup treba da se primenjuje i za Grad Kragujevac, a sesije posvećene obuci i jačanju kapaciteta mogu se proširiti da bi obuhvatila šire područje inačice obućenja privrednih kompanija za održavanje puteva i ulica (koja je za Kragujevac i umnogome) obzirom na to što su u većini pravila i propisa o održavanju javnog sektora unutar raspoloživih JKP-a, određena kompanija može poboljšati svoj kapacitet, povećati svoju konkurenciju i uspeh ukoliko bi se očekivalo da će se proširiti ona područja za koja su ove kompanije najbolje uspješne (u odnosu na to što su u većini pravila i propisa o održavanju javnog sektora unutar raspoloživih JKP-a).

Procena kapaciteta javnog sektora upravljanja i nadzora za obavljanje redovnog i zimskog održavanja u okviru PBMC-a otkrila je neke nedostatke u procesu i unutrašnjoj organizaciji. Gorenedvedene kancelarije gradske uprave imaju praktično-tradicionalnu organizaciju upravljanja s nekim prelaznim elementima (tabela 5). Ove kancelarije pokazale su da imaju jasno razumevanje svoje funkcije i strukture, ali obavljaju i određenu količinu zadataka kojima se preklapaju. Iako su one okarakterisane kao manje strukture s povećanim angažovanjem spoljašnjih doba vlajaca, ovo angažovanje u osnovi je u javnom sektoru, barem u pogledu pružanja aktivnosti održavanja ulica i puteva.

It is also significant to mention that the highest contract values for private contractors range from couple of hundreds EUR to more than a million, but the average is about EUR 0.5 million. Assuming that these are contracts with duration over one construction season or one-year maximum, it can be concluded that local companies can consume approximate value of an annual contract in the range EUR 0.5 to 1.5 million. This is estimated as sufficiently high to satisfy the needs of PBM contracting for maintenance of roads and streets within the City of Kragujevac.

The only public sector company surveyed (PUC “Čistoća”) has unique experience in routine and winter maintenance in the Kragujevac area. It is doubled with the availability of facilities around the City. It is a large organization with very limited independence, given that they are majority-owned by the City and to great extent operate through direct contracts awarded by the City of Kragujevac. It is also clear that provision of maintenance services by this company is more like a forced solution in the absence of relevant specialization within available PUCs than a real wish of the PUC “Čistoća” to perform these works (only about 11% of turnover).

Training and capacity building sessions that improve private contractors’ understanding of the structure of PBMCs can improve contractors’ performance and increase the number of firms able to bid for these contracts. Such approach should also be implemented for the City of Kragujevac and training and capacity building sessions may be spread to cover wider area in the central Serbia in order to enable better competition and success if decided to proceed with the public procurement.

Assessment of management and supervision capacity of the public sector to carry out routine and winter maintenance under a PBMC revealed some deficiencies in the process and internal organization. The above involved City administration offices are practically traditional management organization, with some transitional elements (Table 5). These offices demonstrate that they have clear understanding of their functions and structure, but they also perform a certain volume of overlapping tasks. Although they are characterized as smaller structures with increased outsourcing of activities, the outsourcing is basically to public sector, at least regarding to provision of maintenance activities of streets and roads.
Osobljive gradske uprave obavljaju svoju funkciju sa značajnom efektivnošću, ali srazmerno niska moć srpske, kao i lokalne privrede ih sprečava da drže korak s tehnološkim dostignućima. Prelazak kvalifikovanog osoblja u privatni sektor ili u druge gradove (ili čak države) smanjuje njihov kapacitet. Sadašnji nivo plata (ograničeni nivo plaćanja za zaposlene u javnim službama) nije dovoljan da privuče dobre talente, a posebno da zadrži iskusne radnike na tržištu gde osoblje sa odgovarajućim nivoom veština i iskustva može da pronade bolje plaćene pozicije u privatnom sektoru i/ili

City Administration staff carries out their functions with the significant effectiveness, but comparatively low power of the Serbian, as well as local economy has prevented them from keeping pace with technological advances. The migration of qualified staff to private sector or to other cities (or even other countries) reduces their capacity. Present level of salaries (restricted payment levels for public service employees) is insufficient to attract good talent and especially to retain the experienced ones in a market where personnel with the appropriate levels of skill and experience are able to

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**Table 5. Characteristics of road management organizations [6]**

| Regulatory context | Traditional | Mixed (transitional) | Modern |
|--------------------|-------------|----------------------|--------|
| Regulation of multiple processes and units | Performance impeded by conflicting roles and responsibilities | Coordinated regulations which promote high degree of transparency and management of key outcomes |
| Structural characteristics | Larger size with operations performed by public works forces having centralized control and minimal delegation | Smaller size with increased outsourcing of functions | Focus on results by small work force which leverages competitive forces for cost and quality control |
| Core services (planning, design, construction, maintenance) | Focus on technical and functional areas rather than long term strategy and effectiveness | Expected performance not clearly defined or highly valued | Focus on management of service providers with effective supervision and defined performance targets |
| Information/management systems | Cumbersome manual systems with limited access to computers | Information technology based contract administration and financial control systems in place | Electronic reporting and communications with integrated systems and extensive use of Internet |
| Financing mechanisms | Dependence on annual allocation of government assigned funds | Budgetary allocations are partially supported by performance based evidence | Adequate and stable funding from dedicated source of government and road user funds |

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**Tabela 5. Karakteristike organizacija upravljanja putevima [6]**

| regulatorni kontekst | regulisanje višestrukih procesa i jedinica | učinak sprečen konfliktnim ulogama i odgovornostima | koordinirani propisi koji promovišu visok stepen transparentnosti i upravljanje ključnim rezultatima |
|----------------------|------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| strukturne karakteristike | velike organizacije sa operacijama koje vrše javna preduzeća koji imaju centralizovanu kontrolu i minimalnu delegaciju | manja veličina s povećanim poveravanjem funkcija spoljašnjim dobavljačima | fokusiranje na rezultate s malo radne snage koja oslobađa konkurentne snage u odnosu na troškove i kontrolu kvaliteta |
| osnovne usluge (planiranje, projektovanje, izgradnja, održavanje) | fokus na tehničkoj i funkcionalnoj oblasti umesto na dugoročnoj strategiji i efektivnosti | očekivani učinak nije jasno definisan ili je visoko ocijenjen | fokus na upravljanju dobavljača usluga putem efikasnog nadgledanja i definisanih pokazatelja učinka |
| informacioni sistemi / sistemi upravljanja | zametni ručni sistemi sa ograničenim pristupom računarima | na raspolaganju su sistemi administracije ugovora na bazi informacionih tehnologija i sistemi finansijskome kontrole | elektronsko izveštavanje i komunikacije sa integriranim sistemima i široko korišćenje interneta |
| mehanizmi finansiranja | zavisnost od godišnje raspodele sredstava koje dodeljuje država | budžetska izdavanja delimično podržavaju dokazi zasnovani na učinku | adekvatno i stabilno finansiranje iz namenskog izvora sredstava vlade i putih fondova |

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| Information/management systems | Cumbersome manual systems with limited access to computers | Information technology based contract administration and financial control systems in place | Electronic reporting and communications with integrated systems and extensive use of Internet |
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in the field of road management activities, including the management of road maintenance works and supervision of works and services, there has been limited existence of adequately qualified and dedicated staff within City Administration for implementation of PBMCs. They hold limited literature knowledge about PBM contracting, without any practical experience. Furthermore, there is no availability of requisite technical and technological means to survey network, assess quality of performed works and monitor PBMCs. City Administration is familiar with national procurement procedures, with very limited experience in IFIs’ procedures.

City Administration will require some element of training and technical assistance in the development of PBMCs and subsequently in the control and certification of the works during initial implementation.

Taking into consideration specific practice of streets and roads network management at the City of Kragujevac, it is recommended to establish basic PBM Management and Monitoring Unit. This unit may be established at the City Administration for Communal and Inspection Affairs because: (i) the recommended approach is to implement the PBM for streets within the GUP boundaries and (ii) this Administration already possesses general capacity to monitor maintenance works.

Main tasks of the unit shall be:

- preparation of PBM;
- management and monitoring of PBM works;
- preparation and follow up of plans and programs;
- preparation of criteria for allocation of financial resources;
- organization and performance of technical control for maintenance works;
- preparation of proposals for contracting maintenance works;
- preparation of materials and decision proposals for the Head of City Administration in the field of work;
- preparation of decisions from the field of responsibilities;
- cooperation with other units and/or departments;
- other duties from the field of responsibility.

The team should initially consist of four permanent members (Head of Unit, two Field Supervisors and Technical Administrator). It is foreseen that the unit would not require any specialized technical equipment at the initial phase. There is only a need to supply staff with several personal computers, printers and tablets (for field work), as well as Field Supervisors with two passenger cars. Computers and tablets should be supplied with relevant software. Estimated amount for the above mentioned equipment and vehicles is approximately EUR 60,000.

Although the authorities in the City of Kragujevac already have experience in road maintenance activities and related supervision of works and services, there has been no experience with PBM contracting in the past. It is envisaged that City Administration would require some element of assistance and training during the initial implementation of PBM contracting for development, managing implementation and monitoring PBMCs.

This assistance may take the form of a full-fledged consultancy agreement or may be accomplished through

**Građevinski materijali i konstrukcije** 60 (2017) 4 (33-51) BUILDING MATERIALS AND STRUCTURES 60 (2017) 4 (33-51)
dobre saradnje s nadležnim organima Grada Kragujevca, konsultant za tehničku pomoć treba da obezbedi i radionicu za zainteresovano osoblje izvođača radova iz javnog i privatnog sektora koji se bave pitanjima održavanja puteva u vezi s pripremom konkurentnih ponuda za PBM radove i upravljanje PBMC-om, koji pokrivaju i redovno i zimsko održavanje.

7 ZAKLJUČAK

Uvođenje PBMC u putarsko poslovanje obično je izazovan zadatak, jer – kao i u slučaju većine novih koncepata – PBMC će verovatno na početku kritikovati oni koji su navikli na stare načine „klasičnih“ ugovora o održavanju puteva i na koncept izvođača radova angažovanog putem „radnih nalogova“, te plaćenim prema količinama izvršenim tokom aktivnosti održavanja puteva.

U stvarnom svetu, najveći problem prilikom uvođenja novih vrsta ugovora o održavanju puteva (kao što je PBMC) predstavljaju prepreke koje uzrokuju stalne probleme većini aktera – težnja ka stvarnim promenama u kulturi održavanja puteva, kao i u mentalitetu svih uključenih aktera, te postepena realizacija novih ugovora.

Rezultat studije pružaju vlastima u Kragujevcu mogućnosti za poboljšanje kapaciteta za upravljanje putnom mrežom u gradu i za efektivno i efikasno obavljanje radova na održavanju puteva.

PBMC koncept pokazao se uspešnim u drugim zemljama i regijama, tako da može biti uspešan i u Kragujevcu. Preporučuje se da jedan pilot-projekat bude realizovan, s ciljem da PBMC postane norma ako taj pilot-projekat pokaže smanjenje troškova i/ili poboljšanu troškovnu efikasnost.

7 CONCLUSION

Introduction of PBMC in the road business is usually a challenging task since, as with most of new concepts, PBMC will probably be subject to critics at the beginning by those who are used to the old ways of “classical” road maintenance contracts and the concept of contractors engaged through “work orders”, and being paid against quantities executed during road maintenance operations.

In the real world, the biggest problem during the introduction of new types of road maintenance contracts (like PBMC) is the obstacle that causes continuous troubles to most of the actors involved - it requires real changes in road maintenance culture and mentality of all actors involved and gradual implementation of new contracts.

The results of the study provide the authorities at the City of Kragujevac with options to improve its capacity to manage the road network within the City and to carry out road maintenance works effectively and efficiently.

PBMCs proved to be successful in other countries and regions, and may also prove as successful in Kragujevac. It is recommended to implement one pilot project with an idea to make PBMCs the norm if the pilot project demonstrates cost savings and/or improved cost-effectiveness.

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REZIME

OCENA I POBOLJŠANJE ODRŽAVANJA GRADSKIH ULICA: STUDIJA SLUČAJA Kragujevac

Igor JOKANOVIC

Grad Kragujevac bori se s pružanjem usluga održavanja puteva zbog ograničenih sredstava i malih kapaciteta unutar postojećih javnih komunalnih preduzeća. Kako bi rešile probleme s tradicionalnim metodama ugovaranja, mnoge agencije za puteve prešle su na ugovaranje radova na održavanju puteva s privatnim sektorem, na osnovu merenja u gradu Kragujevcu, primenom ugovora o održavanju na učinku. U radu su prikazani rezultati studije sprovedene radi poboljšanja postojeće prakse i stanja urbanske mreže u gradu Kragujevcu, izvođači ugradnje novih učinaka.

Ključne reči: gradsko učenje, udržavanje, upravljanje, ugovaranje, kapacitet, izvođač radova, merenje.

ASSESSMENT AND IMPROVEMENT OF URBAN STREETS MAINTENANCE: CASE STUDY Kragujevac

Igor JOKANOVIC

City of Kragujevac struggles with providing road maintenance services due to limited funds and low capacity within the existing Public Utility Companies. As a solution to problems with traditional methods of contracting, many road authorities have moved to contracting road maintenance works to the private sector based on performance measures. The paper presents the outcomes of the study conducted for the purpose of improving current practice and condition of urban network within the City of Kragujevac through the application of performance-based maintenance contracting.

Key words: urban streets, maintenance, management, performance-based contracting, assessment, improvement, contractor, capacity.