MAINTENANCE AND REPAIR SPENDING REALITIES: WHAT CAN BE DONE?

K WALL

Department of Construction Economics, University of Pretoria, Private Bag X 20, Hatfield 0028; 082 459 3618; Email: kevin.wall@up.ac.za

ABSTRACT

Treasury has laid down that municipalities shall budget for maintenance and repair an annual sum equivalent to 8% of the "carrying value" of "property, plants and equipment and investment property".

The guidance provided by this ruling is invaluable. However to what extent do municipalities pay much heed?

This paper outlines and comments on the current guidelines, presents the spending realities and points to the consequences of these, and speculates on ways forward.

1. OBJECTIVE

Infrastructure, viz public buildings, roads, water and sewerage systems, electricity and other services, supports quality of life and is the foundation of a healthy economy. The stock of infrastructure owned by government and its agencies is massive and increasing at a rapid rate. However the maintenance of this stock varies greatly from sector to sector, and also from institution to institution within a sector.

The purpose of infrastructure is to deliver services. Poor infrastructure condition because of lack of maintenance and neglect of needed repair is a threat to service delivery – SATC audiences do not need to be convinced of this. However maintenance and repair of infrastructure needs political and institutional will on the part of those responsible for the infrastructure. It also needs systems, skills and budget – infrastructure-owning public entities[1] need guidance on setting annual budgets for maintenance and repair.

While the condition of infrastructure owned by many public sector entities in South Africa can justly be described as "very good", thanks to their world-class infrastructure asset management practices, the condition of much other infrastructure ranges from merely "satisfactory" down to "unfit for purpose". (CSIR[2] 2017a, CSIR 2017b, CSIR 2017c, CSIR 2017d, DWS[3] 2019 and SAICE[4] 2017) Estimates of the extent of the rehabilitation and repair backlog abound – for example, for roads, of the order of R 400 billion. (Ross & Townshend 2019.)

[1]The term "entity" is used in a broad sense, to include national and provincial government departments, municipalities, other statutory bodies (such as water boards), and state-owned enterprises. The term also includes the entities which e.g. municipalities might own and which have been set up in order to focus on various aspects of service delivery (e.g. in Ekurhuleni, Ekurhuleni Water Care Company (ERWAT), and in Johannesburg, City Power and Johannesburg Roads Agency).

[2] Council for Scientific and Industrial Research.

[3] (national) Department of Water and Sanitation.

[4] South African Institution of Civil Engineering.

This paper is not a review of infrastructure asset management planning and practice. Rather, its purpose is to draw attention to budgeting for infrastructure maintenance and repair (and its spending), one of the key issues which must be addressed if infrastructure asset management planning and practice by the South African public sector is to improve.

2. BACKGROUND

Regrettably, most entities have for many years underfunded maintenance and repair. This has been coupled with widespread evident expectation (or wishful optimism) on the part of many decision-makers that infrastructure can continue to provide sterling service despite specified periodic maintenance not being done. (Neglect of maintenance of Eskom generation capacity over the decade prior to 2020 is a case in point.) Moreover, new infrastructure is regularly brought into service with little attention paid to the need to maintain it thereafter.

High-profile statements from senior Cabinet ministers since about 2014, when Minister Gordhan announced the “Back to Basics” initiative, with the need to maintain infrastructure a prominent element, have made politicians, officials and the general public, more aware of maintenance and the need to budget for it. The announcement by the same Minister (by then Minister of Finance) in his 2017 budget speech that one of the four "game changers" would be "improved asset management, including adherence to 8% of the value of assets being spent on their maintenance" (National Treasury 2017, page 14) was widely welcomed by the infrastructure asset management community.

3. THE NEED FOR GUIDANCE

Infrastructure-owning public entities (national, provincial, municipal and parastatal) need guidance on setting annual budgets for maintenance and repair.

This guidance needs to take into account major variables, particularly, for each infrastructure component:

- The type of infrastructure (e.g. road foundation, culvert, retaining wall, pump, excavator, substation, clinic);
- Current age;
- Current condition;
- Current workload (e.g. of a road, how heavily is it trafficked?[5]); and
- The expected remaining useful life under normal operating conditions and a maintenance regime which has conformed to manufacturers’ specifications; as opposed to;
- The estimated remaining useful life under the actual (or predicted, if this could be different) operating conditions and the actual (or predicted) maintenance regime.

However few South African entities have anything like sufficient quantity or quality of information of the type they need in order to budget appropriately, i.e. the type of information listed in the bullet points immediately above. Where it is available, the relatively nuanced budgeting guidelines such as those of the CIDB[6] (CIDB, 2007) can be

[5] Another example of the "ageing" effect of workload: courier companies commonly dispose of their light delivery vehicles within two years of purchase because, despite operation and servicing to manufacturers’ specifications, given high usage commonly in excess of 100,000 km travelled per annum, their wear-and-tear is several multiples faster than that of an exact equivalent vehicle purchased by the average household for occasional utility purposes.

[6] Construction Industry Development Board.

used. Better still, budgets should be indexed to condition knowledge specific to, and an infrastructure asset management plan for, each infrastructure component.

But what to do where the information on infrastructure and its condition isn't available (i.e. the common situation)?

3.1 Guidelines Based on "Value"

A number of authoritative publications, recognising that most public sector entities are the custodians of a wide range of infrastructure types, have recommended that the entities' overall budgets for maintenance be determined as a percentage – percentage, that is, of some or other concept of "value" or "replacement cost"– or on some or another concept of usage[7] or time elapsed. Within that overall budget, then, budget funding should be distributed between infrastructure types, and infrastructure components, as required.

Treasury itself offers guidelines based on a particular concept of "value" of the infrastructure. The way this is defined, it is not "value" as in for example "value to service delivery". As one might expect from an organisation which thinks primarily in terms of monetary units, Treasury's concept of "value" is a financial one. Specifically, the guidelines are based on "carrying value", which may be defined as:

> "Carrying value is the original cost of an asset, less the accumulated amount of any depreciation or amortization, less the accumulated amount of any asset impairments."
> https://www.accountingtools.com/articles/what-is-carrying-value.html

Engineers would no doubt ask – as the author did – if there is any difference between "carrying value" and the more familiar "book value".

> "The term book value is derived from the accounting practice of recording asset value based upon the original historical cost in the books. Book value can refer to several different financial figures while carrying value is used in business accounting... In most contexts, book value and carrying value describe the same accounting concepts."
> https://www.investopedia.com/ask/answers/010815/what-difference-between-book-value-and-carrying-value.asp

Several times a year, Treasury issues "circulars" in terms of the Public Finance Management Act (PFMA) – applicable to the national and provincial spheres of government – and Municipal Finance Management Act (MFMA), applicable to municipalities. For the purposes of this paper, the key circular is "MFMA Circular No. 71: Municipal Finance Management Act No. 56 of 2003: Uniform Financial Ratios and Norms" (National Treasury, 2014).

This Circular, in the process of providing sets of "uniform key financial ratios and norms suitable and applicable to [in this case] municipalities and municipal entities", inter-alia lays down budget guidelines indexed to "carrying value". The guideline of interest to the current paper appears on page 4 (National Treasury, 2014)

[7] Original equipment manufacturers, for example, generally recommend budgeting on the basis of replacement cost of the equipment or on a condition assessment or on the basis of usage (e.g. running hours). A familiar example is a motor vehicle. The manufacturers typically recommend servicing at 15,000km intervals. Furthermore, at specified intervals (e.g. at 60,000km) the vehicle's servicing manual identifies specific parts to be replaced and for other specific components to be given a more comprehensive service than that at 15,000km.

The first part of the Section 3 “Repairs and Maintenance as a % of Property, Plants and Equipment and Investment Property (Carrying Value)” is reproduced below:

Purpose / Use of the Ratio
The Ratio measures the level of repairs and maintenance to ensure adequate maintenance to prevent breakdowns and interruptions to service delivery. Repairs and maintenance of municipal assets is required to ensure the continued provision of services.

Formula
Total Repairs and Maintenance Expenditure / Property, Plant and Equipment and Investment Property (Carrying Value) x 100.[8]

Norm
The norm is 8%.[9]

Although this guideline is very far from good infrastructure asset management practice, Treasury is to be commended on introducing such a practical and convenient measure. In contrast, the published internationally-accepted standards for infrastructure asset management require budgeting according to principles which so many entities in South Africa would find difficult to follow and/or which would require information which they generally do not have. For example, many would not be able to use a guideline which suggests that budgets are linked to infrastructure current replacement cost (CRC), for the simple reason that so few of them know the CRC of their infrastructure assets.

Furthermore, given that many, especially the less-capacitated municipalities, lack understanding of the extent and complexity of the infrastructure in their care (and, it must be said, even less understanding of the condition of that infrastructure), this Treasury “8%” guideline can justifiably be regarded as an essential first step to improved infrastructure asset management practice.

3.2 Guidelines Based on Replacement Cost

A perusal of the most respected literature on budgeting for maintenance and repair shows that guidelines are generally based on the replacement cost of infrastructure. Which presupposes that entities have a reasonably complete inventory of their infrastructure, together with sufficient information as to type, capacity, age, condition, and other relevant aspects.

Authoritative South African publications on maintenance and repair principles are:

1. The “National Infrastructure Maintenance Strategy (NIMS): Infrastructure Maintenance Budgeting Guideline” (CIDB 2009), a key section of which is “5. Infrastructure Budgeting Guideline”, which offers “indicative budgeting guidelines for various types of infrastructure to be maintained”. The document recommends “Average Annual Maintenance Budget as Percent of Replacement Cost” for 12 typical types of infrastructure (e.g. “roads and stormwater”, “electricity reticulation”, “schools”).

[8] Noting that the numerator is an operational expenditure figure, and the denominator is a valuation based on historic capital expenditure.

[9] Although the Circular does not specifically say so, it could only be intended that this is a "percentage per annum".

2. The CIDB's "National Immovable Asset Maintenance Standard for immovable assets under the custodianship of National and Provincial Departments of Works" (Department of Public Works and CIDB 2017 – abbreviated NIAMM) does not offer budgeting guidelines of its own. Instead it refers to those of the NIMS guideline (CIDB, 2009) quoted above.

3. The various International Infrastructure Management Manuals over the years set out from the start to be a "how to prepare infrastructure asset management plans" primer. The most recent editions (IMESA[10], 2011; IPWEA[11], 2018) are no exception to this. They, too, do not offer budgeting guidelines, preferring to advocate that budget requirements be derived from the infrastructure asset management plans.

4. Treasury's own Infrastructure Development Management System (IDMS), the context of which is new infrastructure only, also refers to the budget guidelines of the NIMS (Treasury, 2018).

While acknowledging that it is international good practice to base budgeting guidelines on understanding of CRC of infrastructure components, it is clear that this approach would not immediately be suitable for many South African public sector entities, especially not for the majority of municipalities. Regrettably, too few of them know the condition of much of their infrastructure. Similarly, few know the CRC of that infrastructure.

It would seem, therefore, that for most entities, the approach advocated by Treasury, based as it is on carrying value, a concept well-known in the public sector, has much merit as an interim measure.

4. MAINTENANCE AND REPAIR BUDGET GUIDELINES FOR THE INTERIM

Treasury requires entities to:

- Itemise all infrastructure of at least a (specified) minimum level of significance;
- Assess the "carrying value" of each component; and
- Use the total carrying value of the infrastructure ("property, plants and equipment and investment property") to estimate the overall budget required for maintenance and repair.

As noted above, for municipalities, how to do this is briefly described in "MFMA Circular No 71", Section 3 "Repairs and Maintenance as a % of Property, Plants and Equipment and Investment Property (Carrying Value)" (Treasury, 2014).

Whereas this method is required by law, it nonetheless needs to be acknowledged that it is providing a budget guideline suitable only for the interim – that is, until such time as entities prepare infrastructure asset management plans, even if no more than basic, and also have the resources to implement the plans. In that interim, all entities should be encouraged to improve their knowledge of their infrastructure, including knowledge of the CRC and remaining useful life of infrastructure components (starting with the most strategic components).

[10] Institute of Municipal Engineering of Southern Africa.
[11] Institute of Public Works Engineering Australasia.

Except for those municipalities able to show they can budget for maintenance and repair on the basis of infrastructure asset management plans, with priority given to strategic infrastructure, entities should, as is currently the case, be given no choice but to budget in terms of this MFMA Circular (or the equivalent for non-municipal public sector entities) – that is, a minimum[12] of 8% be budgeted for:

Total Repairs and Maintenance Expenditure
(expressed as Rand per annum)

divided by

Property, Plant and Equipment and Investment Property
(expressed in terms of its Carrying Value)

5. HOW DO CURRENT BUDGET (OR SPENDING) LEVELS COMPARE WITH THE 8%?

The great majority of entities, including some well-resourced ones, spend far less than the recommended norm of 8% of carrying value. Some municipalities, according to Treasury's website "Municipal Money"[13], spent even less than 1% during the course of the most recent financial year captured on that website (i.e. 2017/2018[14]) – some recorded spending 0%![15] (Box 1, Table 1.)

Box 1: Maintenance and repair spending by a municipality selected randomly from Municipal Money – showing how the information is presented[16]

Spending on Repairs and Maintenance Financial Year: July 2017 - June 2018

• **Spending on Repairs and Maintenance** July 2017 - June 2018: **1.55%**
• Spending on Repairs and Maintenance as a percentage of Property, Plant and Equipment.
  • **More than double** the spending for similar municipalities in KwaZulu-Natal: 0.7%
  • **More than** the spending for similar municipalities nationally: 0.2%

[12] Circular 71 does not actually use the word "minimum" in connection with the 8%. The word "norm" is used. However the context makes it clear that "minimum" is implied. Thus, under "Interpretation of Results", it is stated that: "A ratio below the norm is a reflection that insufficient funds are being spent on repairs and maintenance ….". (Treasury 2014 page 4)

[13] https://municipalmoney.gov.za/

[14] At the time of writing this paper (January 2020), still the most recent financial year for which data is available on the Municipal Money website.

[15] Caution: the Municipal Money website was found to be not free of errors. Also, quite a few key statistics are recorded as "not available".

[16] There is also a bar chart of the spending in the most recent four financial years.

Table 1: Recorded spending

Random sample of municipalities (Not metros)	**Actual spending** (per "Municipal Money")	
	2016/2017 FY	2017/2018 FY
In W Cape	2.7%	2.1%
In E Cape	2.0%	1.4%
In E Cape	0.0%	0.0%
In KZN	0.0%	0.0%
In KZN	2.0%	1.6%
In F State	0.9%	0.7%
In F State	1.3%	1.3%
In Mpumalanga	1.2%	1.2%
In North West	1.0%	1.2%
In Gauteng	0.0%	0.0%

While it is acknowledged that many entities have severe financial problems, Treasury, using whatever mechanisms it has at its disposal, must as a priority address gross underspending on maintenance and repair by wayward municipalities.

The alternative is broken infrastructure and consequent unreliable service delivery.

Information on selected non-metropolitan municipalities indicates that they spent around 2% on average during 2017/2018 i.e. one-quarter of the Treasury minimum. Such a low level is catastrophic for the condition of infrastructure – little wonder that the 2017 infrastructure report card graded "other[17] paved municipal roads" as "D minus" (i.e. "at risk of failure") and deteriorating, and another key municipal infrastructure service, namely, "water supply for all other[18] areas" also as "D minus" (SAICE, 2017).

Infrastructure in this condition will be catastrophic for service delivery – if, in some areas, it is not already.

Metropolitan municipalities spend on average double that of non-metropolitan municipalities.[19] Still much too little.

The extent to which this basic planning good practice (never mind implementation of that planning, starting with funding of the planned infrastructure maintenance and repair) is not embedded in municipalities is highlighted by the Auditor General each year. For example, Figure 1 below (Auditor General 2019, page 5):

[17] Other, that is, than roads in metropolitan areas.

[18] Other, that is, than major urban areas.

[19] Comparative figures are readily available for the eight metropolitan municipalities for "municipal budget and benchmarking engagement" for the 2019/2020 financial year. Bearing in mind moreover that these are budget figures, not actual expenditure (which is, on past record, likely to turn out to be less than the amount budgeted), Treasury is correct to voice "concern … that all metros are below the norm and may face infrastructure failure in the near future". (Treasury 2019, slide 19). The range is from 7.4% (Cape Town) to 2.0% (Buffalo City). EThekwini is the second-highest (7.0%), and Nelson Mandela second lowest (2.5%). "Average" is 4.7%. Comparable 2017/2018 actual expenditure: 8.6% (Cape Town – from Municipal Money website); 1.9% (Buffalo City – same source); 2% (Nelson Mandela – website); 7% (eThekwini – from CFO, whereas Municipal Money indicated 0%).

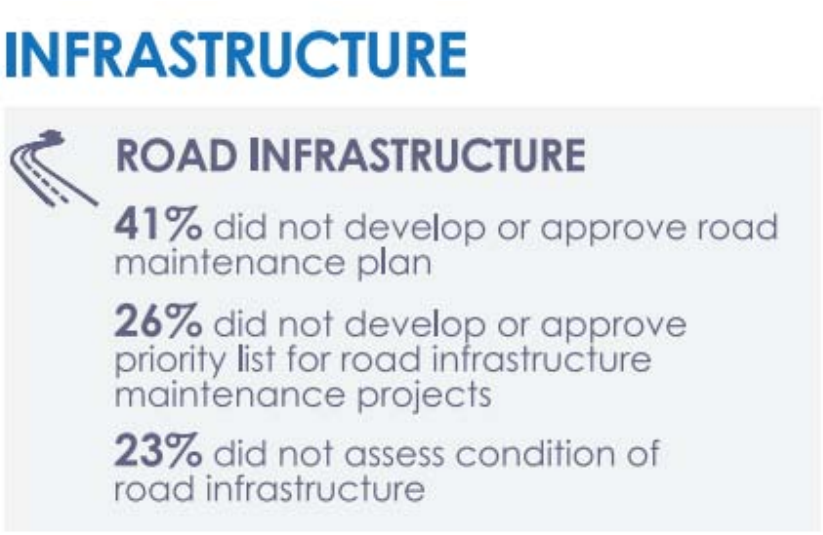

Figure 1: Infrastructure maintenance planning, per Auditor General

6. CONCLUSIONS

That municipalities, the sphere of government responsible for many basic services, to such great extent neglect to fund maintenance and repair of the infrastructure which is entrusted to them specifically so that they may deliver the services, is not acceptable. Yet this is how it has been for years, and waves of interventions, be they policies or incentives or on-the-ground assistance, have generally failed to bring about significant improvement.

Ideally, change should come from within the municipalities. That is, more political will at municipalities, i.e. the councillors understanding their role as stewards of the infrastructure, and putting this understanding into practice through support for more funding of maintenance and repair.

Understanding that this change from within takes place but seldom, government's response in the past has generally been to attempt closer oversight and to offer more "capacity building". Despite billions of rand and many years of effort, success has been limited.

However it is the author's opinion that, whatever other measures are adopted, a selective realignment of the powers and functions of the three spheres of government must also be considered. The maybe naive question should be asked – if municipality XYZ cannot afford, and is unlikely ever to be able to afford, to maintain at least a good proportion of the infrastructure it owns, should responsibility for this infrastructure not perhaps be allocated to another institution which can? After all, there are precedents for this – for example, over several years, responsibility for several thousand kilometres of provincial road were, for good reason, transferred to SANRAL.

This realignment would necessarily be selective in the sense that only dysfunctional municipalities should be targeted, not those which are coping or more or less coping. All of this in the cause of improved maintenance and repair – and consequent improved service delivery to our citizens.

Determining budget, especially at municipal level, is highly contested. As the CEO of SANRAL pointed out, the "critical question" is: "how much does engineering inform needs and priorities in a political landscape dealing with a tight budget and a scarcity of skills?"

He put so well the unfortunate result of infrastructure needs so often losing out in the above-mentioned contestation:

> "One of our greatest challenges is that we are choosing to fix our [infrastructure] when … at their most expensive – when the damage has been done and we are desperate." (Macozoma, quoted in Frankson 2018)

7. **REFERENCES**

Auditor General. 2019. *Consolidated General Report on the Local Government Audit Outcomes: MFMA 2017-18. Performance Snapshot.*

CIDB 2009. Construction Industry Development Board (CIDB). *National Infrastructure Maintenance Strategy (NIMS): Infrastructure Maintenance Budgeting Guideline*. Available at: http://cidb.org.za/publications/Documents/Infrastructure%20Maintenance%20Budgeting%20Guideline.pdf.

CSIR. 2017a. *The state of major airports infrastructure in South Africa.* (Draft report, unpublished).

CSIR. 2017b. *State of rail infrastructure in South Africa.* (Draft report, unpublished).

CSIR. 2017c. *The state of road infrastructure in South Africa.* (Draft report, unpublished).

CSIR. 2017d. *Commercial port infrastructure in South Africa.* (Draft report, unpublished).

Department of Public Works (DPW) and CIDB (2017a). Construction Industry Development Board (CIDB). *National Immovable Asset Maintenance Management Standard.* Available at: http://www.cidb.org.za/publications/Pages/Infrastructure-Maintenance.aspx.

Department of Water and Sanitation. 2019. *Strategic overview of the water sector in South Africa 2019.* Available at: http://ws.dwa.gov.za/nkps/docs/ftp_uploads.aspx#!

Frankson, L, 2018. Roads to social and economic growth. *IMESA*, November/December 2018, page 25 – quoting the CEO of SANRAL's address to the South African Roads Federation regional conference for Africa.

IMESA 2011. *International Infrastructure Management Manual: International Edition 2011.* Institute of Municipal Engineering of Southern Africa.

IPWEA 2015. *International Infrastructure Management Manual: 5th edition.* Institute of Public Works Engineering Australasia.

National Treasury 2014. *MFMA Circular No. 71: Municipal Finance Management Act No. 56 of 2003: Uniform Financial Ratios and Norms*. Available at: http://mfma.treasury.gov.za/Circulars/Documents/Circular%2071%20-%20Financial%20Ratios%20and%20Norms%20-%2017%20January%202014/MFMA%20Circular%20No%2071%20Financial%20Ratios%20and%20Norms%20%20-%2017%20January%202014.pdf.

National Treasury, 2017. *Minister of Finance: Budget Speech*. 22 February 2017.

National Treasury, 2018. *Infrastructure Delivery Management System IDMS: Module 8 Operations and Maintenance Management.*

National Treasury, 2019. *2019/20 Municipal Budget and Benchmarking Engagement: Metros.*

Ross, D & Townshend, M 2019. *The road maintenance backlog in South Africa*. South African Transport Conference. Pretoria, July 2019.

SAICE, 2017. *The SAICE 2017 infrastructure report card for South Africa*. The South African Institution of Civil Engineering. (September 2017). Available at: http://saice.org.za/wp-content/uploads/2017/09/SAICE-IRC-2017.pdf.