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GOING BEYOND THE INFRASTRUCTURE FUNDING GAP:

A SOUTH AFRICAN PERSPECTIVE

South Africa and the Sustainable Development Goals (SDGs)

- South Africa ranks 113th out of 161 countries in terms of its performance in relation to the 17 SDGs

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Sectors and specific SDGs the study focuses on

Transport

Water and sanitation

Basic Education

TVET

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Several scenarios were developed and analyzed to:

- Quantify the infrastructure (capex and opex) and related spending needs and the funding gap to achieve the SDGs,
- Assess the implications of different policy choices on spending needs and funding gap,
- Identify policies that can help South Africa achieve the SDGs.

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OUTLINE

1. Setting the stage
2. Spending needs
3. Transport
4. Water and sanitation
5. Basic education
6. TVET
7. Infrastructure resilience
8. Macro implications

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Spending needs

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Closing the SDG gap will require significant spending until 2030

Transport		Water and Sanitation		Basic Education		TVET		Total
Minimum spending scenario: less ambitious goals, mostly lower efficiency								
R1000 billion 1.68% of GDP	+	R1125 billion 1.97% of GDP	+	R2485 billion 4.69% of GDP	+	R203 billion 0.38% of GDP	=	R4813 billion 8.72% of GDP
Preferred scenario: ambitious goals, high efficiency								
R1295 billion 2.26% of GDP	+	R1243 billion 2.17% of GDP	+	R2505 billion 4.73% of GDP	+	R411 billion 0.78% of GDP	=	R5454 billion 9.94% of GDP
Maximum spending scenario: more ambitious goals and/or lower efficiency								
R1456 billion 2.54% of GDP	+	R1427 billion 2.49% of GDP	+	R2569 billion 4.85% of GDP	+	R709 billion 1.34% of GDP	=	R6161 billion 11.22% of GDP

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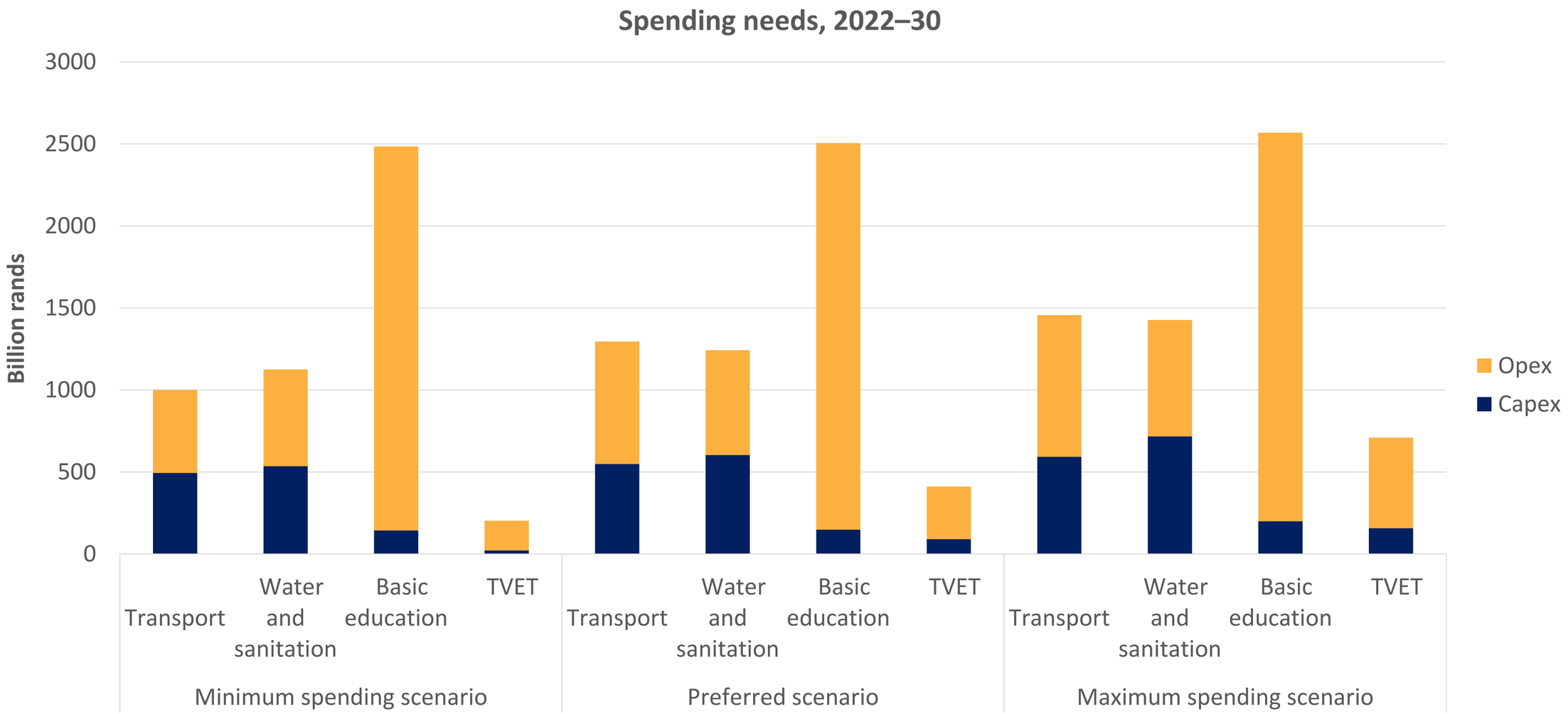
More than half of the needs are for operations and maintenance and other recurrent spending



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Transport

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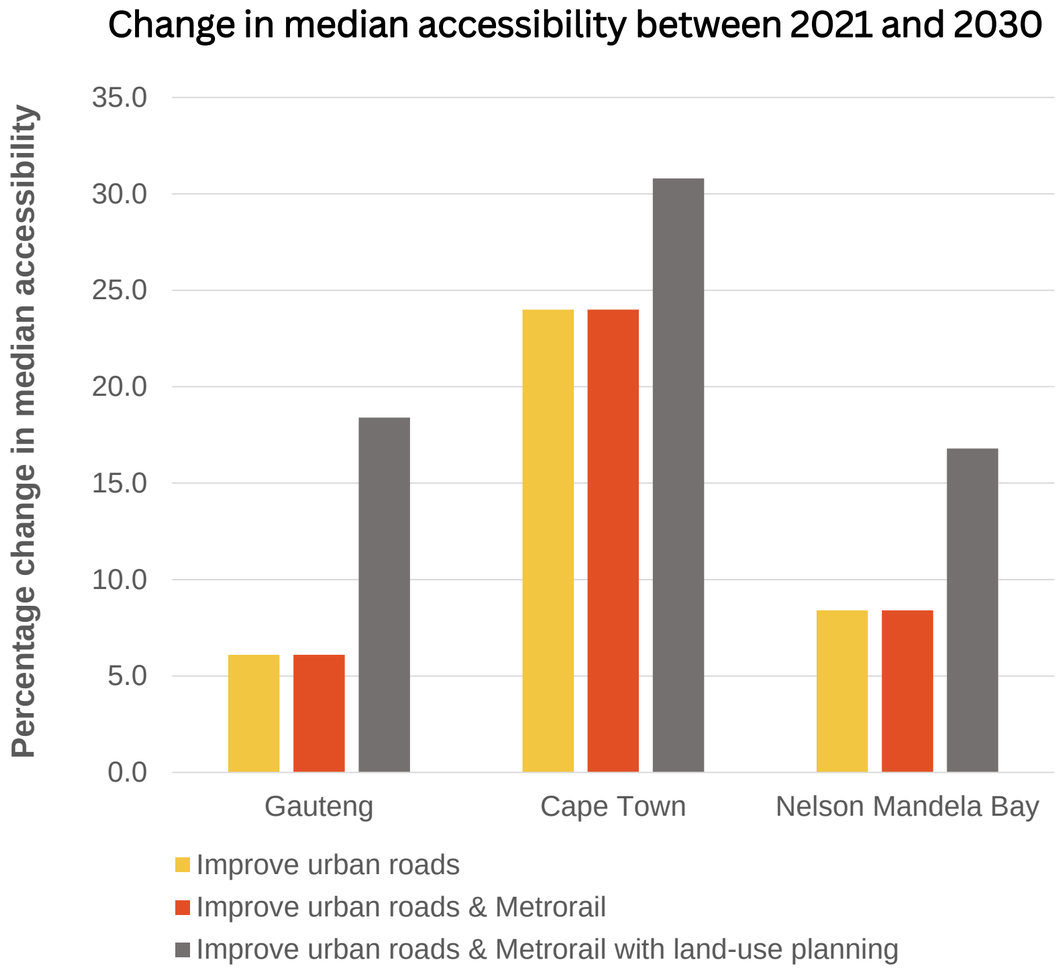
A large part of the sustainability gap in transport is due to the quality and management of existing infrastructure and services

- **Urban access:** 58 out of 140 countries – rapid transit to resident ratio of 3.1 km/million people.
  - BRTs qualify as rapid transit, but not Metrorail lines because of poor service levels.
  - There is a significant maintenance backlog and need for strengthening urban roads.
- **Rural access:** 80 out of 183 countries (based on 2016 data) – rural access index (RAI) of 74%.
  - But based on 2020-21 data, the RAI in South Africa is only 57.5%.
  - Only 24% of rural roads are all-weather roads because of poor condition.
- **Safety:** 143 out of 183 countries – mortality caused by road traffic injuries of 25.9 per 100,000 people.
  - Speed and drunk driving are major contributors to road traffic crashes.
  - 85% of the high traffic road network has an iRAP star rating below 3.

Operations and maintenance (O&M), and integrated land-use and transport planning are key to achieve sustainable urban mobility

- Affordability is a key challenge to be overcome: In 2020, 30.8% of households identified travel cost as the most important element in making transport choices.
- The total funding needs range between R366 and R864 billion for the period 2022-2030 (0.65%-1.53% of GDP per year on average).
- O&M costs range from 80% to 89% of the total costs.
- The restoration and improvement of Metrorail demands the largest resources, representing 0.7% of GDP per year on average.
- Unless there is integrated land-use and transport planning, large transport investments will not improve accessibility.



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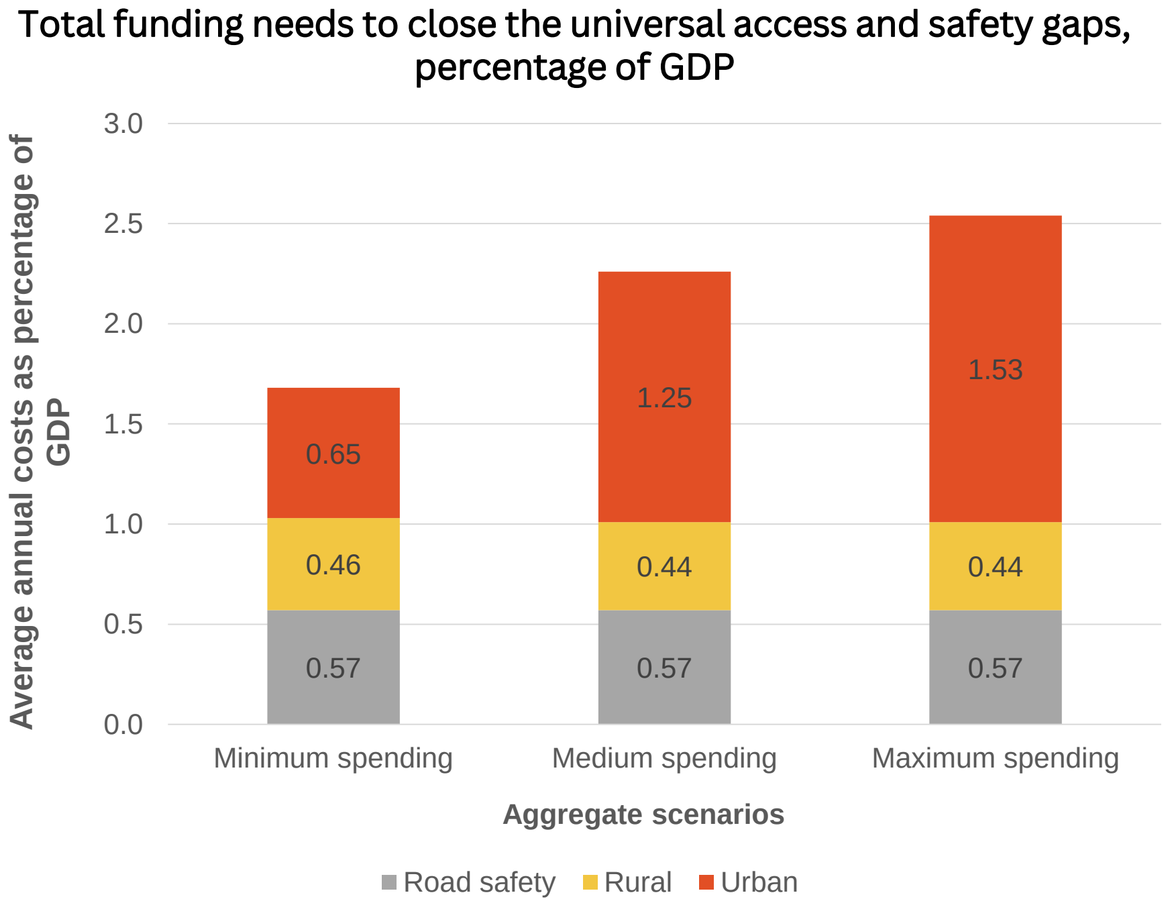
The average annual infrastructure cost to improve sustainable mobility ranges between 1.7% and 2.6% of GDP in 2022-2030

- The total cost ranges between R1 trillion and R1.5 trillion for the period 2022-2030.
- In the preferred scenario, the total cost is R1.3 trillion, which amounts to 2.3% of GDP per year on average.
- All the scenarios include the cost of bringing 75% of the high traffic roads to a 3-star rating
- Total cost: R322 billion in 2022-2030, equivalent to 0.57% of GDP per year on average.



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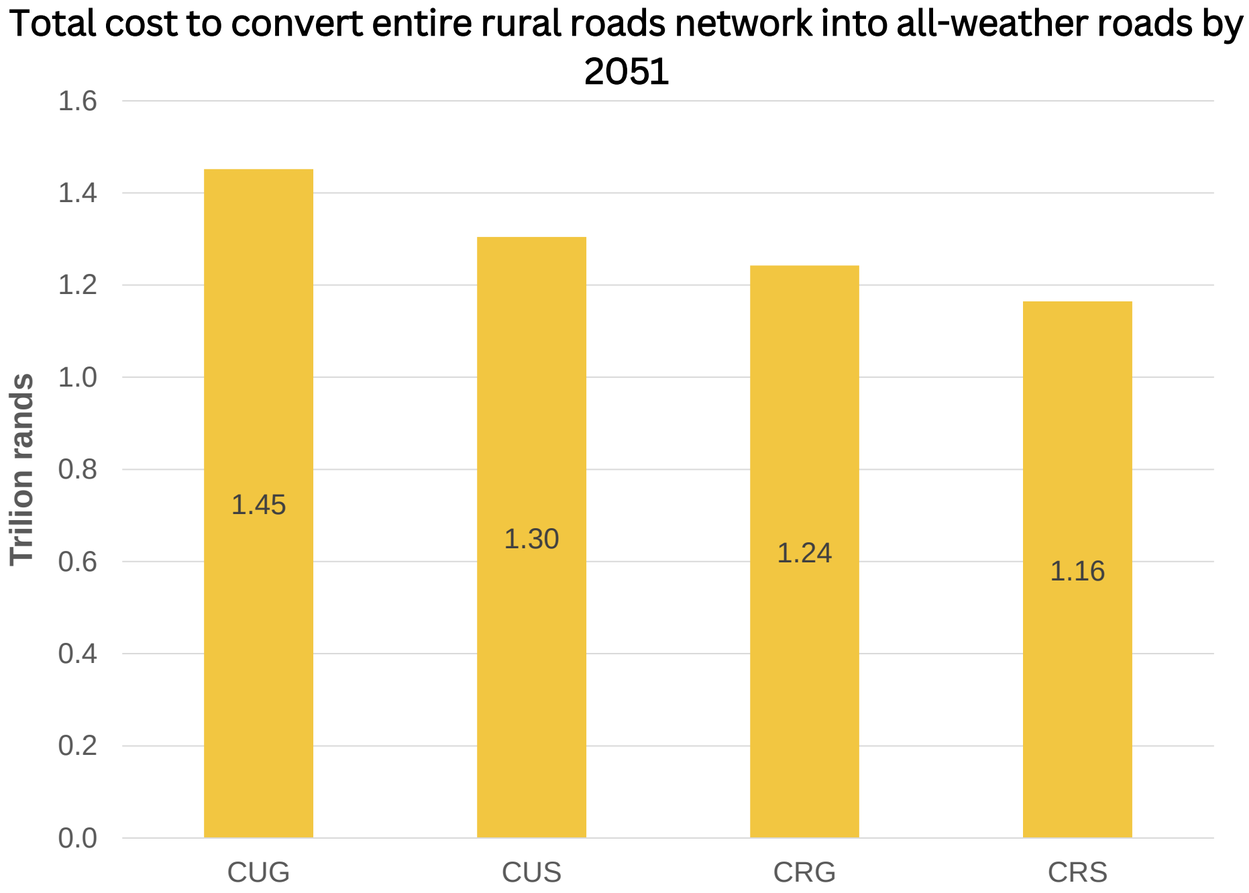
Achieving sustainable rural transport requires a long-term focus and strategic planning

- A focus on achieving the highest possible RAI (94%) by 2030 will cost the most.
- The efficient—i.e., least cost—policy is to pave all rural roads and rationalize the network.
- 26% of total costs are for rehabilitation and maintenance
- Rationalizing the network and paving roads will allow the government to increase the RAI faster with the available funding
- Paved roads are safer and more resilient to flooding than gravel roads.



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Recommendations

Urban Transport:

1. Improve the affordability of urban transport.
2. Review and update the integrated public transport network (IPTN) plans and strengthen integration between land use and transport planning to maximize access and ensure fiscal sustainability of proposals.
3. Recognize minibus-taxis as a key part of solutions to South Africa's public transport challenges alongside other modes and work with minibus taxi industry role-players to enhance its efficiency.
4. Support PRASA to refine its recovery plan with clear and costed capital investment and operational action plans, and to expedite programs to restore rail services.
5. Implement long-standing policies for devolution of authority over public transport.

Rural Transport:

1. Rehabilitate deteriorated paved strategic roads and pave all unpaved strategic roads.
2. Develop a rationalized basic road network and seal all roads in this network.
3. Ensure that sufficient resources are allocated to the maintenance of assets, which includes routine maintenance and rehabilitation.
4. Ensure that roads departments are adequately capacitated with qualified staff and equipment to manage the road assets under their control.
5. Ensure road authorities develop and adopt climate resilient road design standards.

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Water and Sanitation

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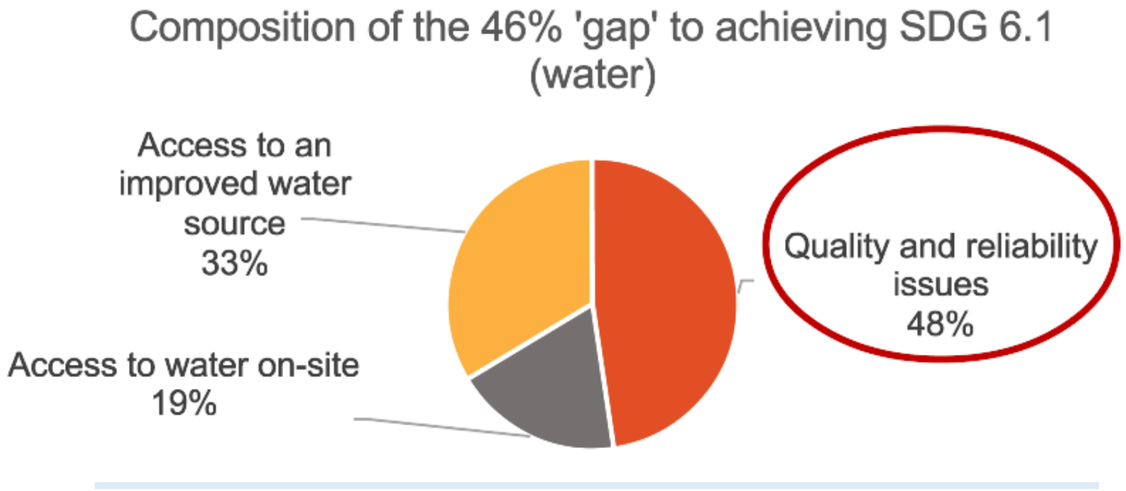
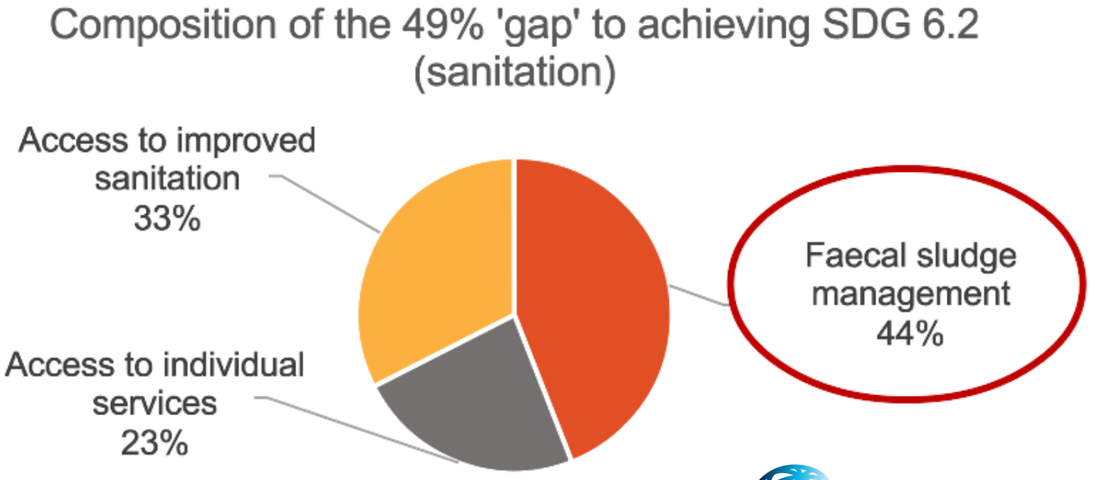
Moving ‘beyond the gap’ for SDG 6-level service access demands addressing both the scale and quality of Water & Sanitation Services

- Achieving SDG 6 is about the provision of new infrastructure and management of existing systems.
- 46% of South African households do not have access to SDG-level water supply
- 49% of households do not have access to SDG-level sanitation

Shift from MDGs to SDGs means a greater emphasis on safety and reliability of services





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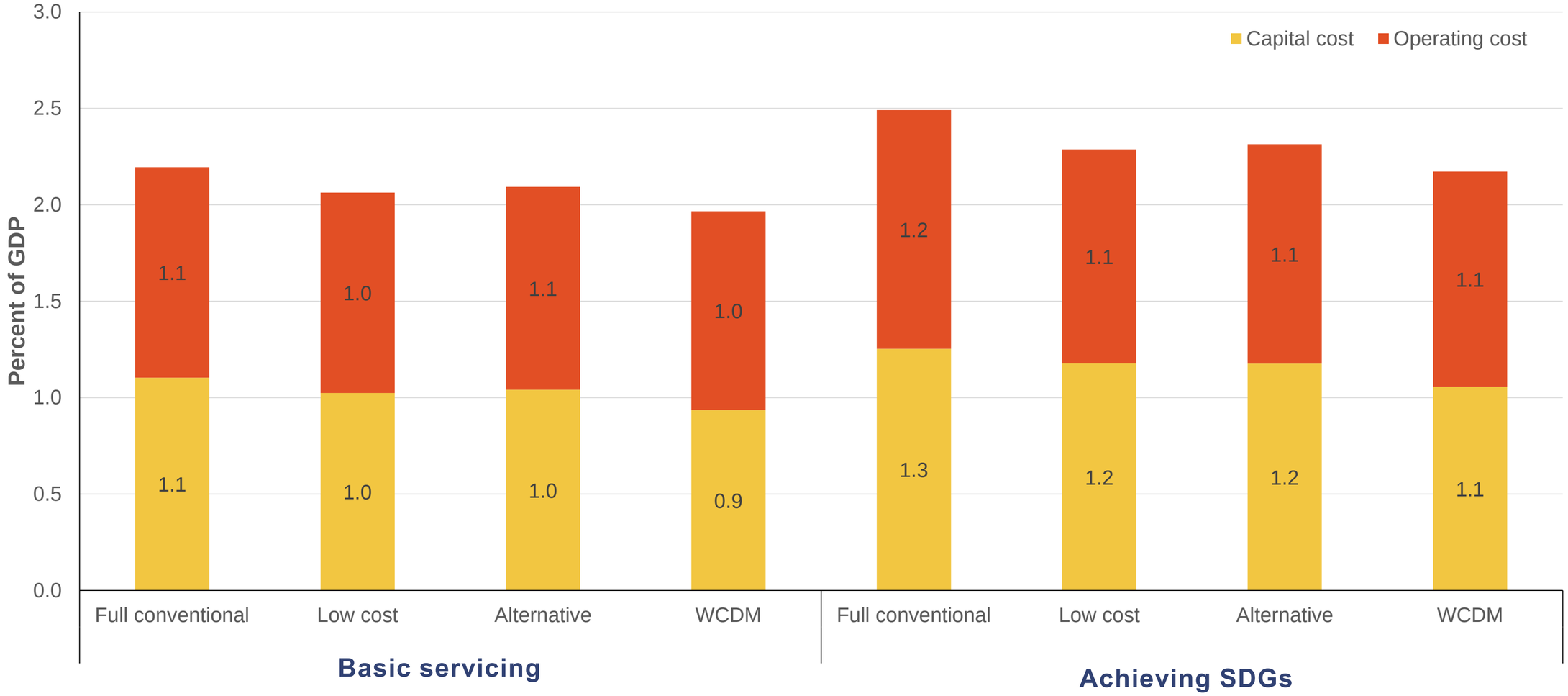
The average annual spending needs in water and sanitation are 1.97%-2.49% of GDP (R125-R159 billion p.a. to 2030)



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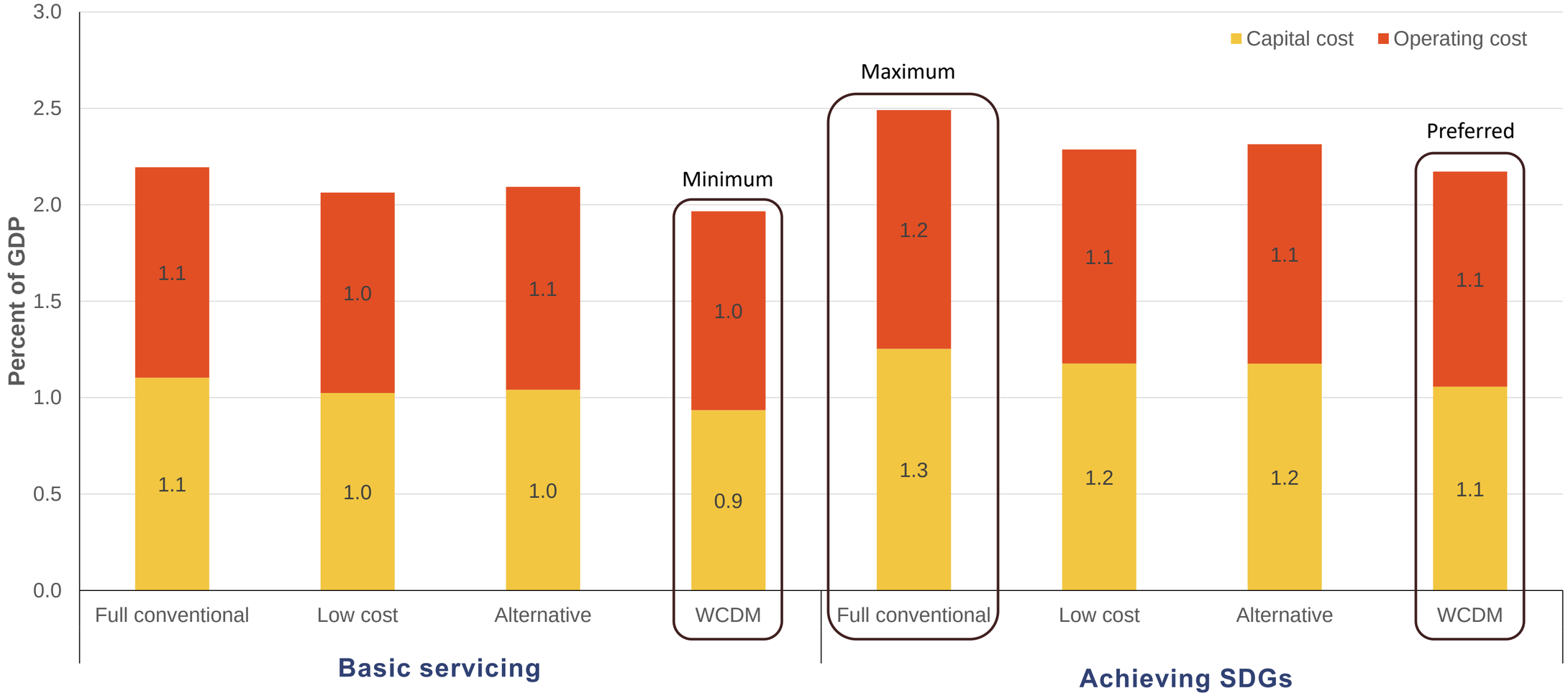

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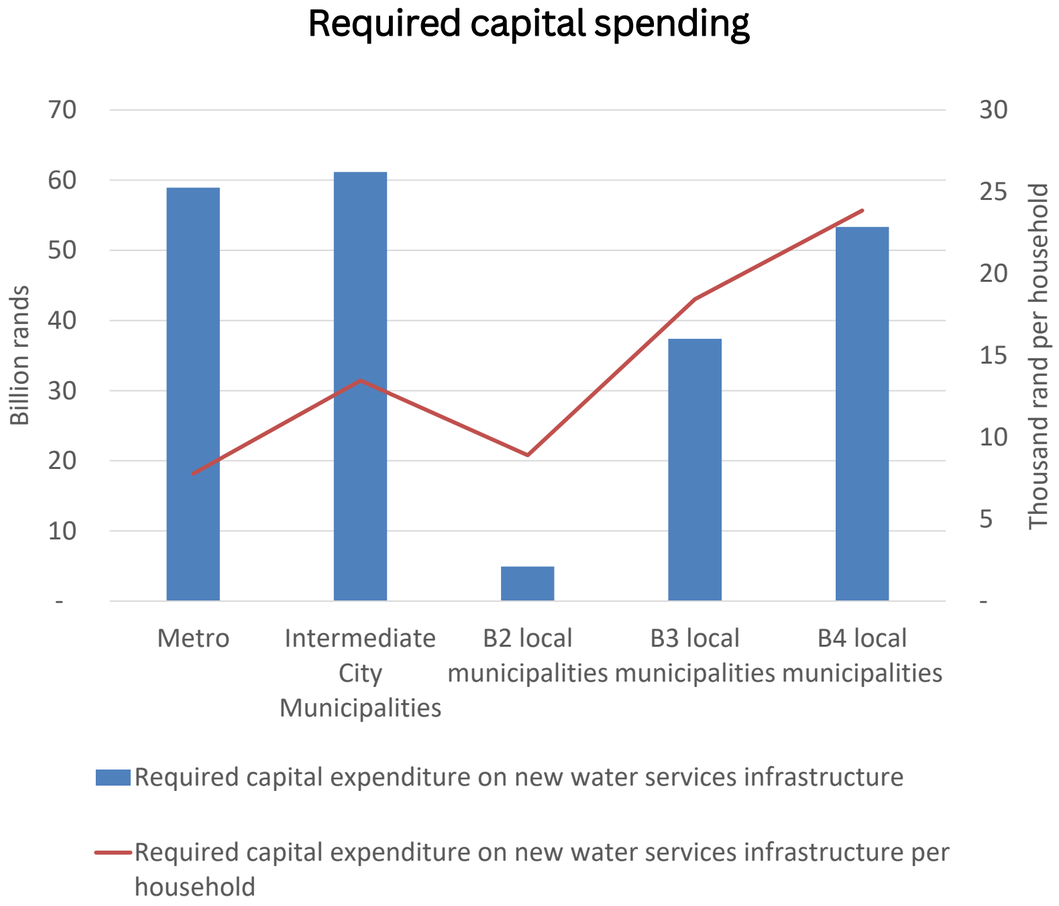
Key messages

- Highest expenditure needed for operating, maintaining and renewing existing infrastructure – NOT new infrastructure. This mirrors the shift from MDGs to the SDGs
- All lowest cost scenarios include higher Water Conservation, Demand Management and renewal of existing infrastructure
- Most expenditure is needed in dense urban areas, where cost per household is also the lowest.



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Recommendations (in order of priority)

1. Implement a nationally coordinated water sector strategy for governance reform, capacity building and institutional strengthening
2. Prioritize, incentivize and increase funding for WCDM
3. Address chronic shortage of funding in the sector
4. Incentivize proper integrated asset management
5. Make appropriate service level choices
6. Initiate a national faecal sludge management programme
7. Better manage water resource allocations
8. Coordinate national efforts on alien plant (IAP) clearing

Practical implementation recommendations for each main recommendation are provided in the report

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Basic Education

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Infrastructure Gap = Upgrading existing schools + …

Facilities that require upgrading

Facility	Total need (number)	Total need (% of schools)
Schools w/o a computer room	15 608	62%
Schools w/o a library	16 833	67%
Schools w/o a laboratory	19 041	76%
Schools w/o a server	21 960	87%
Toilet seats needed in schools (which are not flush or VIP latrines)	123,799	22% of toilet seats
Schools that don't have access to electricity	1956	8%
Schools that don't have access to water	2292	9%
Schools with mud/ clay/ wooden classrooms	2 408	10%
Schools with broken floors	4 254	17%
Schools with broken ceiling	3 084	12%

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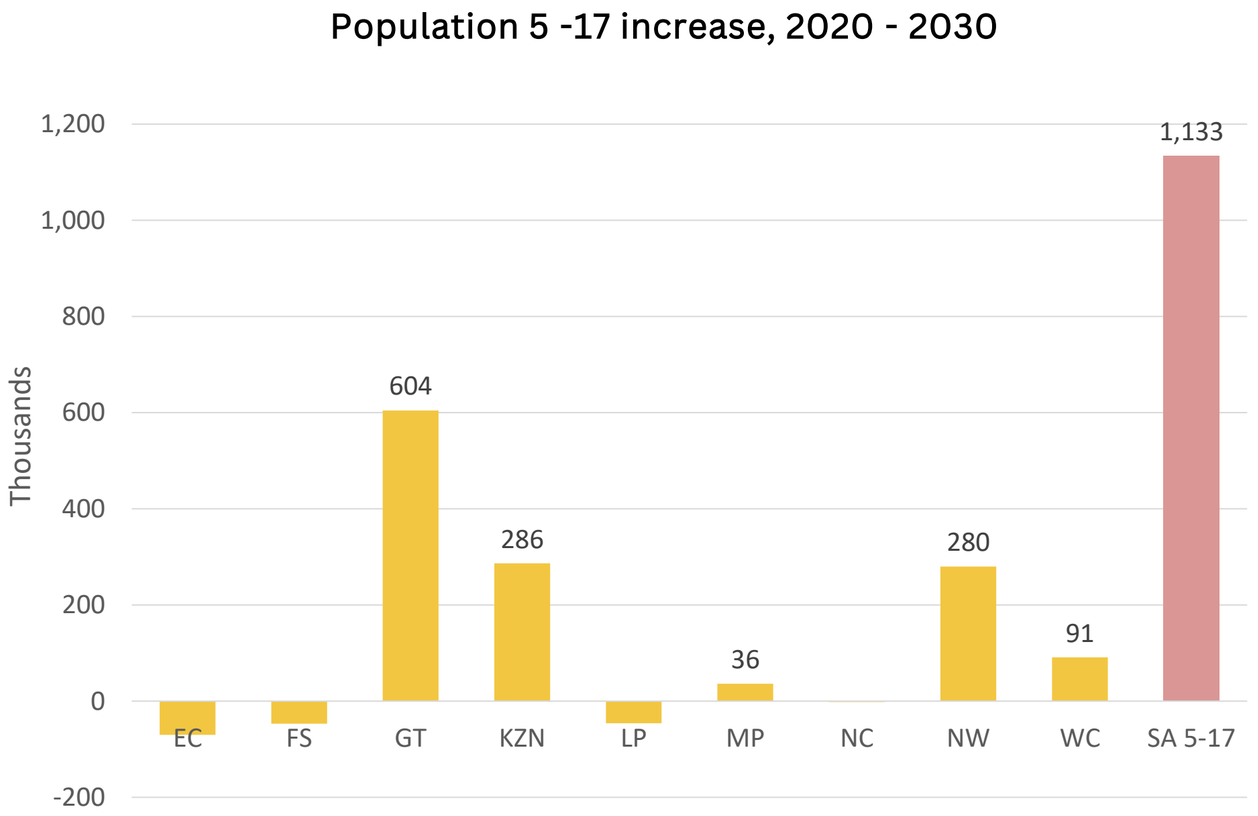
…anticipated expansion (new classrooms/schools) to accommodate growing population

Needs and costs of expansion driven by three factors:

- Policy decisions – student-teacher ratios, student-classroom ratios, early childhood development provision, Grade 9 school leaving certificate.
- Construction implementation arrangements – centralized, decentralized to provincial level, community-based implementation.
- Size of school – small, medium or large.



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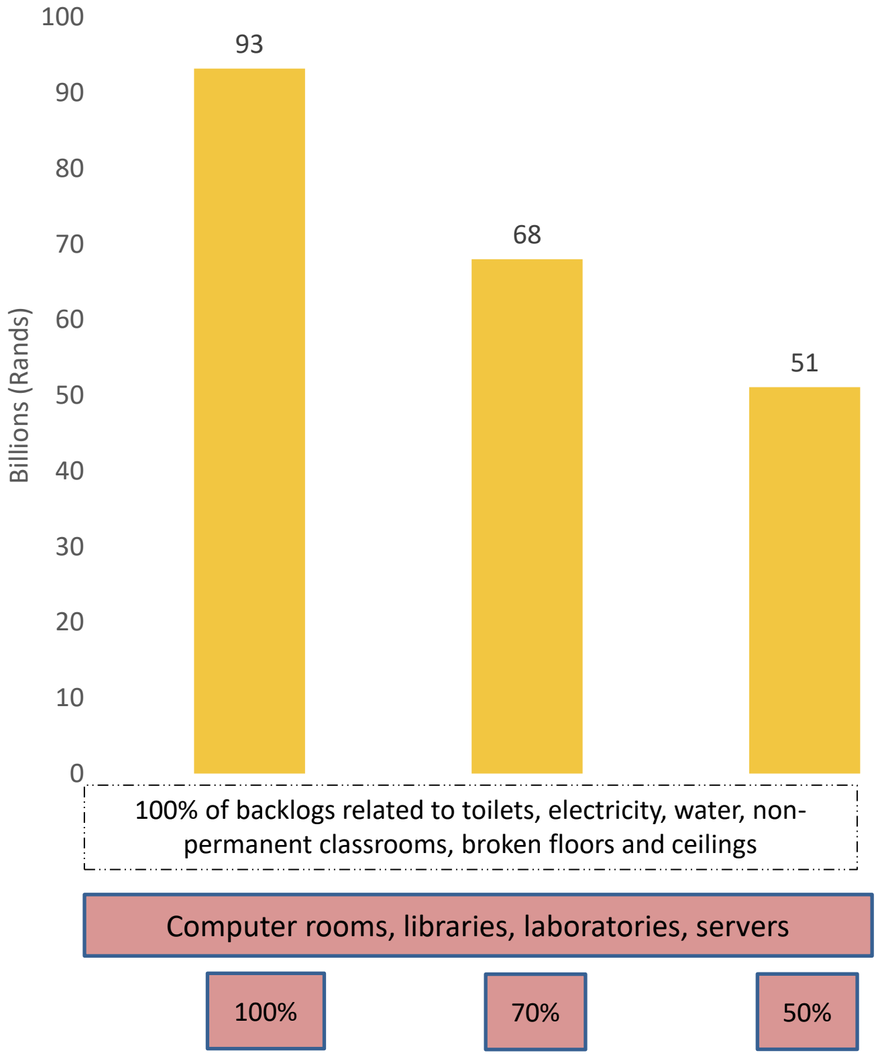
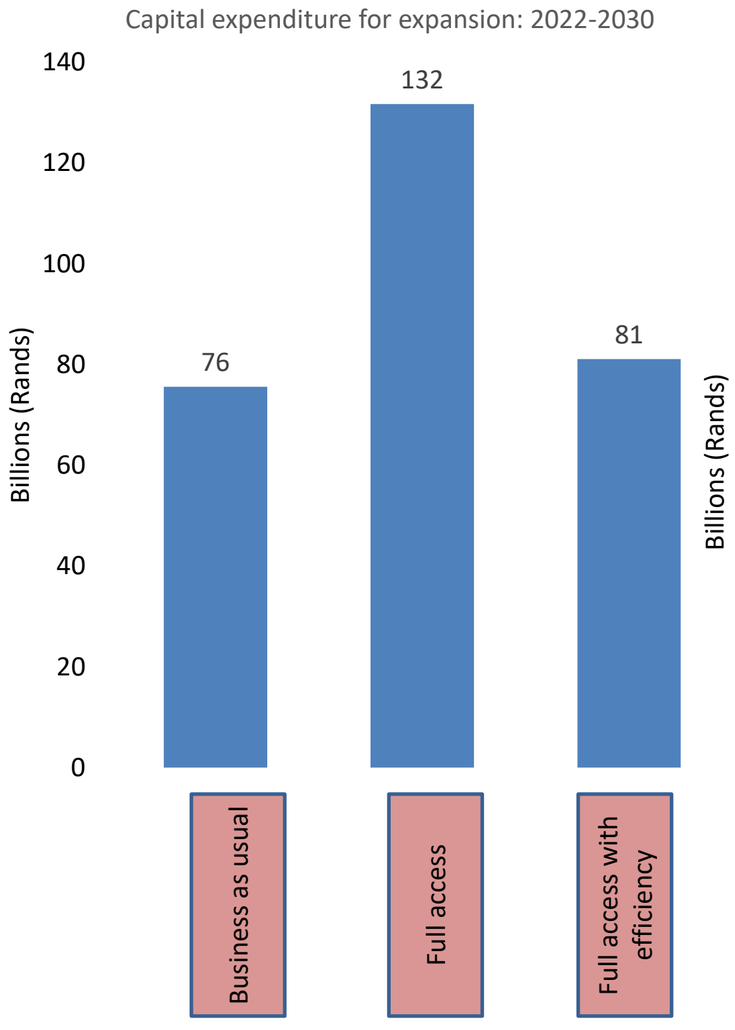
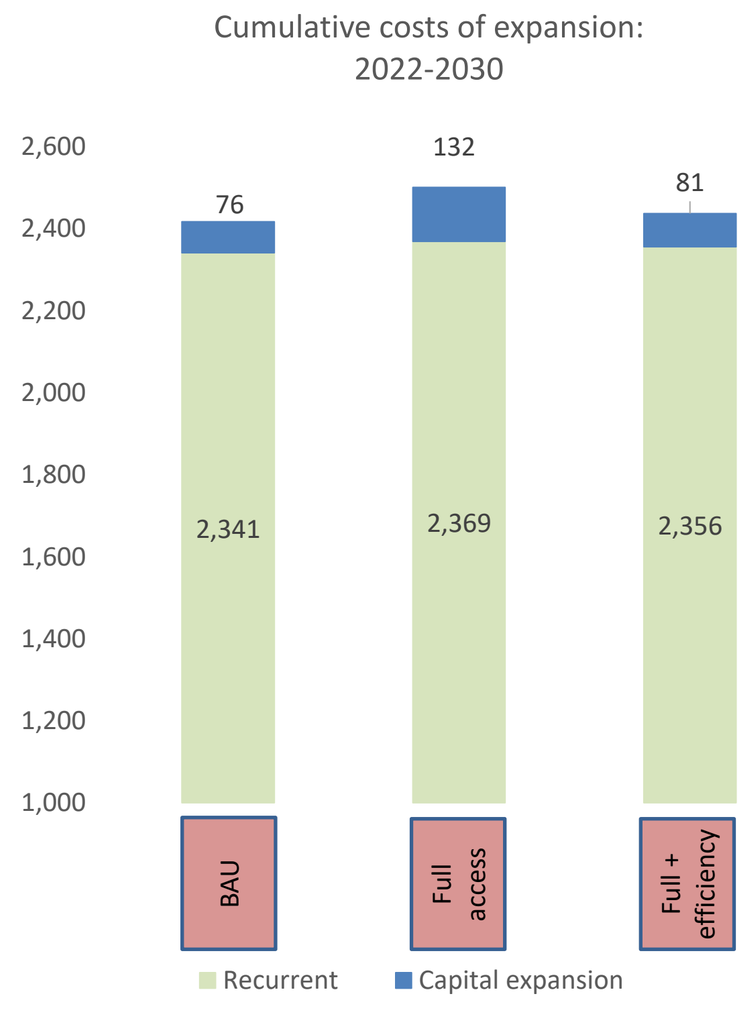
The combined recurrent and capital costs of upgrading and expanding basic education by 2030 ranges between R2.48 trillion and R2.57 trillion.

Upgrading options



Expansion options





Recommendations (in order of priority)

1. **Review the minimum norms and standards for school infrastructure**
    - Prioritize ‘minimum’ package of facilities over ‘optimum’. Prioritize what facilities should be built in the first phase (an essential, minimum package) versus what facilities should be built in a second or third phase in the same school (optimum package).
    - Adopt classroom libraries in primary schools and digital libraries in secondary schools.
    - Make digital connectivity a norm in schools. Start with the most disadvantaged schools offering secondary education and rapidly move towards primary schools.
2. **Change the implementation modality mix for school construction**
    - Leverage opportunities for better value for money and school ownership through engagement of communities/School Governing Boards.
    - Focus on small construction works to afford more opportunities and competition among small contractors.

Recommendations (cont.)

3. **Build better date monitoring and dissemination systems for school construction to improve accountability and transparency**
    - Ensure that the National Education Infrastructure Management System (NEIMS) is regularly updated and linked to the Education Management Information System (EMIS).
    - Develop a systematic process to collect data on unit costs of construction from across the country.

6

TVET

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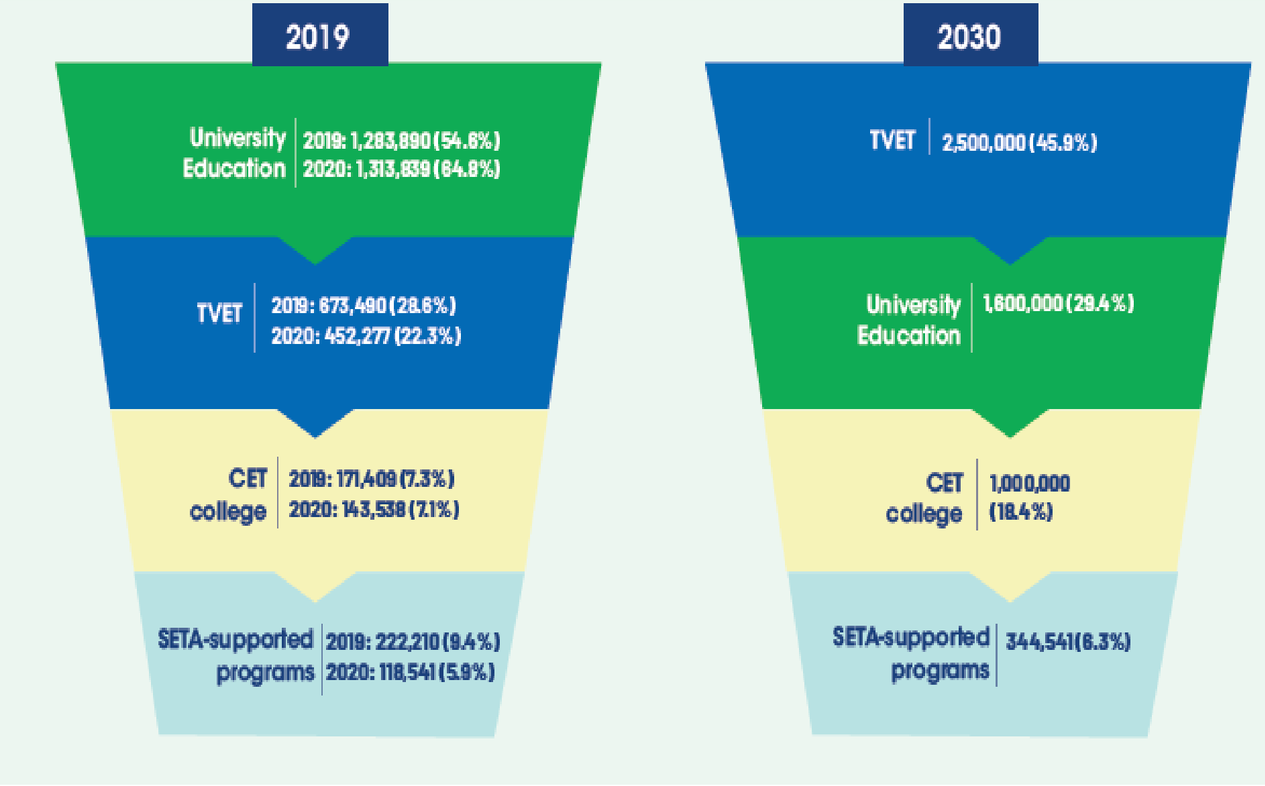
Ambitious targets for TVET enrollment expansion but funding has been limited with quality and efficiency concerns

- To meet TVET enrolment targets, there is a need to rapidly expand TVET infrastructure in South Africa

- In addition, existing campuses need to be renovated: 50% (130 out of 254) of campuses were found to be in poor condition

- In addition, South Africa is aiming for significant quality and efficiency improvements in TVET at a massively expanded scale



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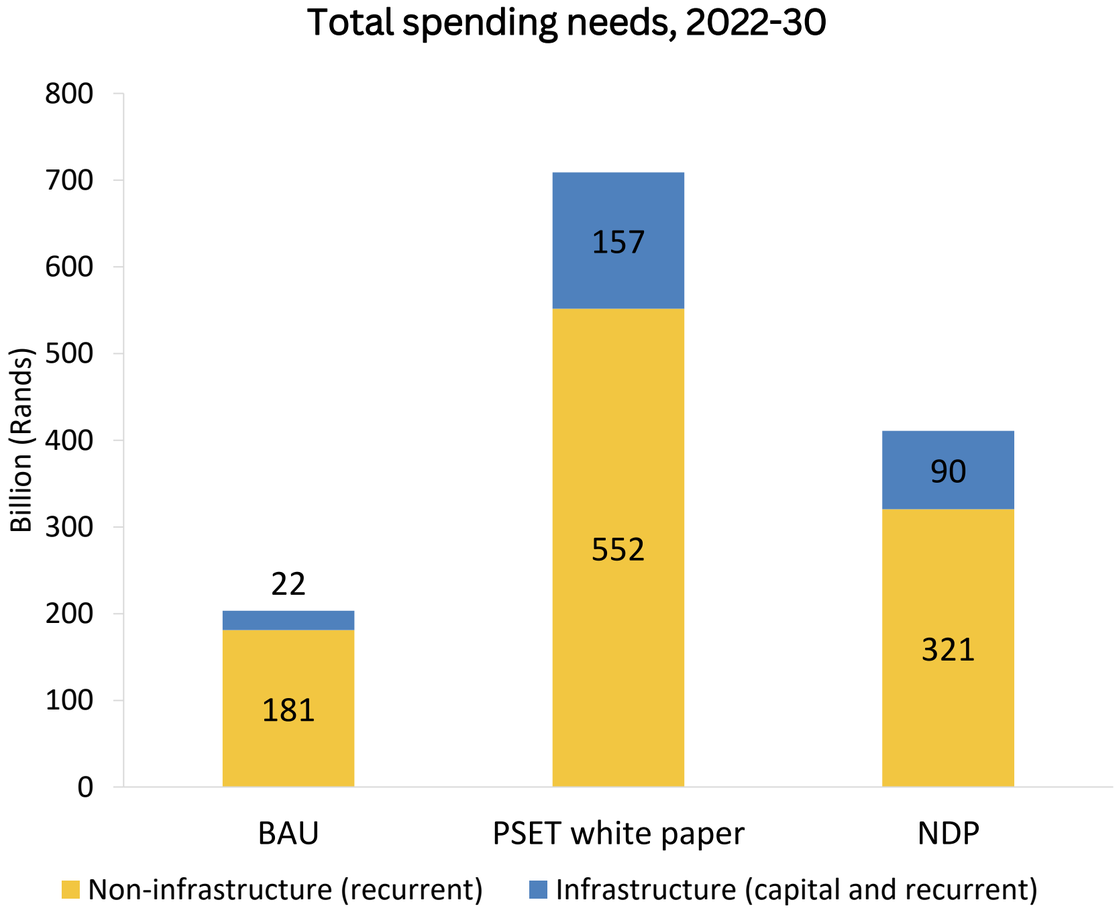
The total cost for upgrading existing facilities and expanding the TVET system under modest NDP targets is R411 billion between 2022-30 and R46 billion annually (0.78% of GDP)

Infrastructure costs:

- Construction of new campuses
- Construction of new hostels
- Rehabilitation of existing hostels
- Installation of infrastructure for distance learning
- Maintenance of facilities

Non-infrastructure costs:

- Salaries for administrators, instructors and support staff
- Student welfare financing
- TVET system operations



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The adoption of technology and alternate modes of delivering TVET could substantially reduce costs

- Distance education to demonstrate impact of adoption of new technologies (such as simulation-based training)
- Alternate modes of delivery (distance education and workplace-based learning)
- Assume recurrent costs are five times lower for distance education compared to on-site training:
  - PSET scenario: 64% higher without distance education
  - NDP scenario: 32% higher without distance education
- Exact efficiencies depend on specific technologies and modalities chosen

Total funding needs for TVET system expansion with and without distance education 2022-30, Billions (Rands)

	Scenarios	
	PSET white paper	NDP
Without distance education		
Non-infrastructure	731	370
Infrastructure	424	166
Total	1 155	535
With distance education		
Non-infrastructure	552	321
Infrastructure	151	84
Total	703	405

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Recommendations

1. **More funding for TVET**
    - Create an enabling regulatory and funding environment for private providers. Greater support for private providers through simplified and more responsive quality assurance mechanism, outcomes-linked government funding, and regular and comprehensive monitoring.
    - Encourage alternate modes of training, such as workplace-based training.
    - Diversify the sources of income for public TVET colleges.
2. **Better TVET infrastructure**
    - Use innovative mechanisms to fund the adoption of technology. For example, leveraging the private sector (venture capital).
    - Develop macro-level space norms and improve the norms for space utilization.
    - Use technology for more efficient space utilisation. Online, or blended learning can reduce the need for classroom space.

Recommendations (cont.)

3. **A more efficient TVET system**

   - Use financial regulations to incentivise quality. More flexible fee ceilings could increase college income and incentivize quality improvements
   - Improve the internal efficiency of the TVET system by improving the quality of instruction, sustained financial aid for long duration programs to reduce dropouts, better access to internships and industrial placement opportunities for students to meet training requirements, and timely certification after examinations.
   - Improved management and accountability at the system level - strengthened capacity to design and implement well-aligned policies, norms, and standards in areas such as quality assurance, financing, and infrastructure development.

7

Infrastructure Resilience

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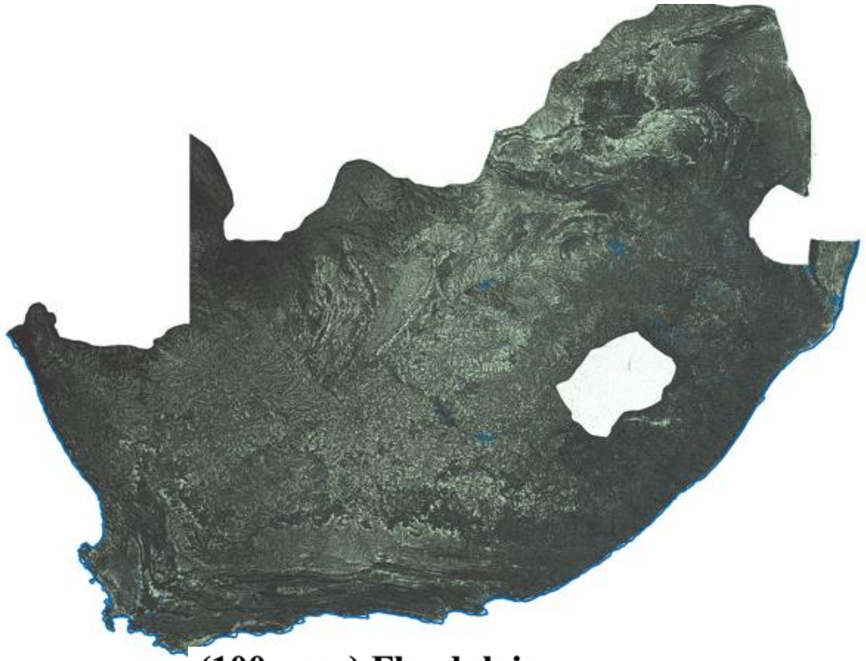
South Africa is exposed to a range of natural hazards

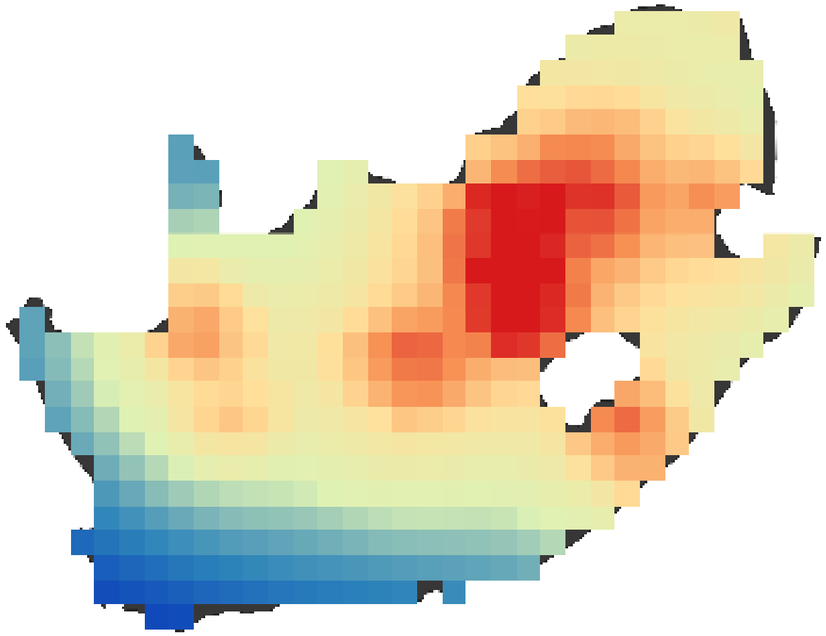
Flooding depth



(100-year) Floodplain
Est. water depth [meters]

< 0.5 m	2 m
1 m	> 2 m
No flood risk	

Seismic risk



Instrumental Intensity
2% exceedance risk in 50-year timeframe
[2475-yr return period]

I	V
II-III	VI
IV	> VI

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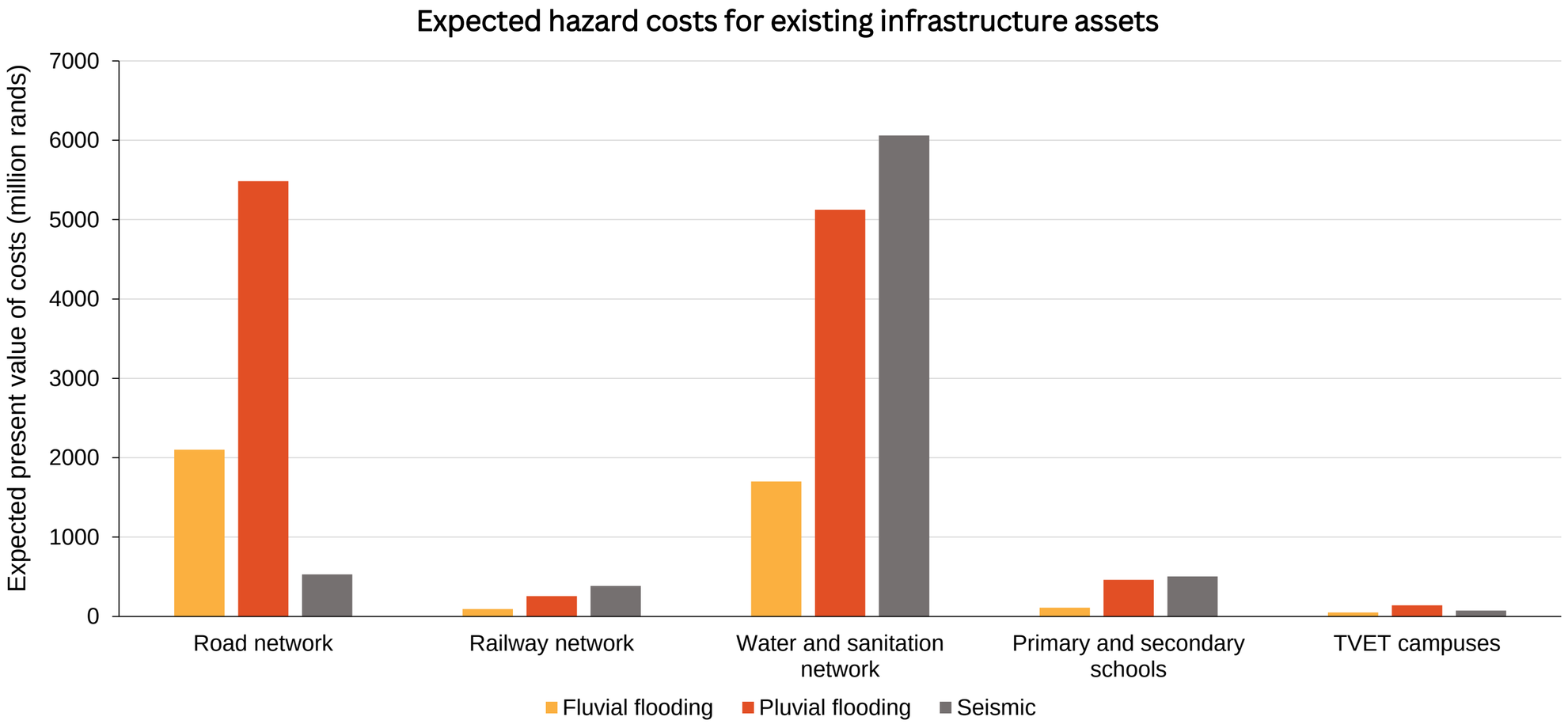
Flooding causes the most expensive direct damages overall, mostly due to its impact on the road network and on water and sanitation assets



The cost of increasing infrastructure resilience is small compared to the funding needs to achieve the SDGs

	Scenarios		
	Minimum spending	**Preferred**	**Maximum spending**
	Billion rands		
Transport (primary roads)	7	7	7
Water and sanitation	2	2	2
Basic education	41	42	45
TVET	9	18	41
Total	59	69	95
	% of GDP (2022—30)		
Total	0.10	0.12	0.17

Note: Transport include the cost to increase resilience against flooding and landslide, water and sanitation include the cost to increase resilience against flooding, while basic education and TVET include the cost to increase resilience against flooding and earthquakes. For transport and water and sanitation the cost of resilience is focused on upgrading existing assets and is thus the same across all three spending scenarios.

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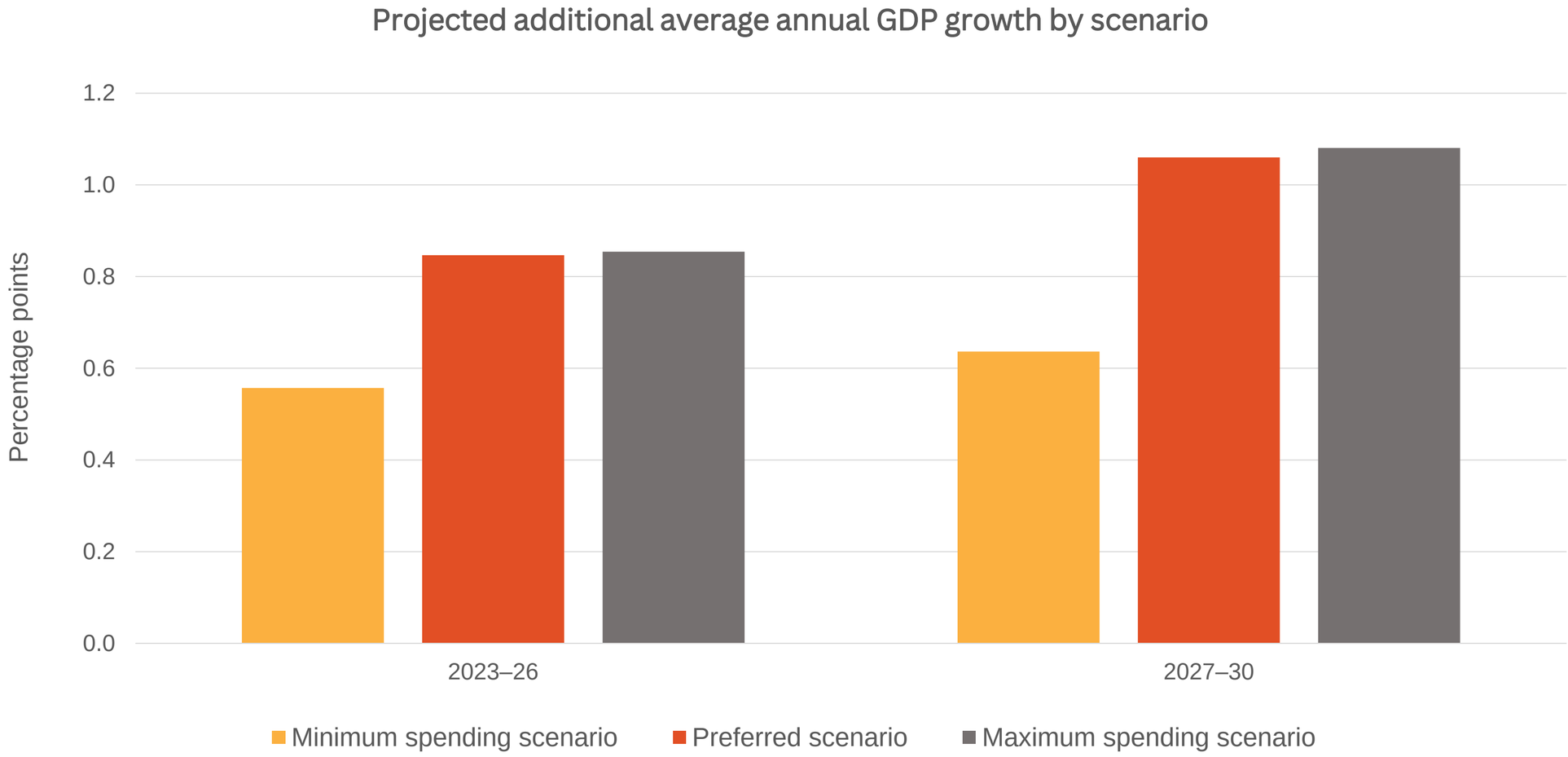
Macroeconomic implications

The preferred scenario yields about 1 percentage point of additional GDP growth in 2023–30, picking up in the second half of the period



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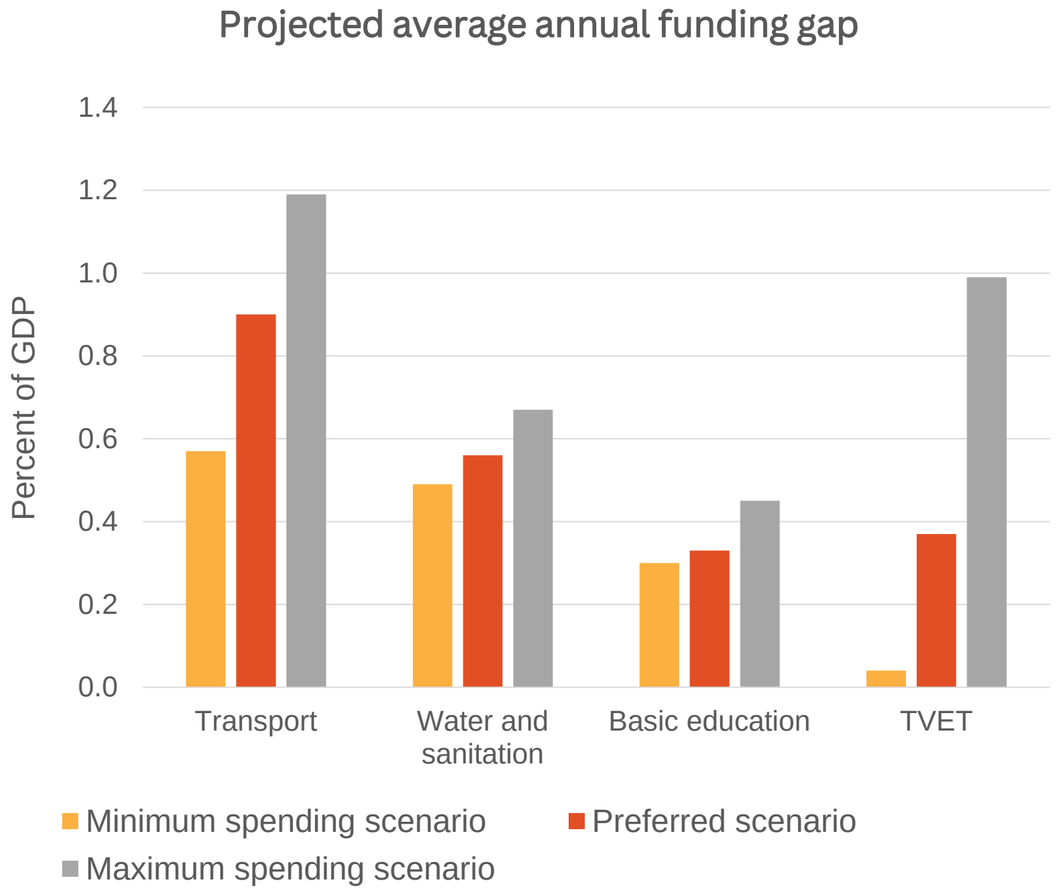
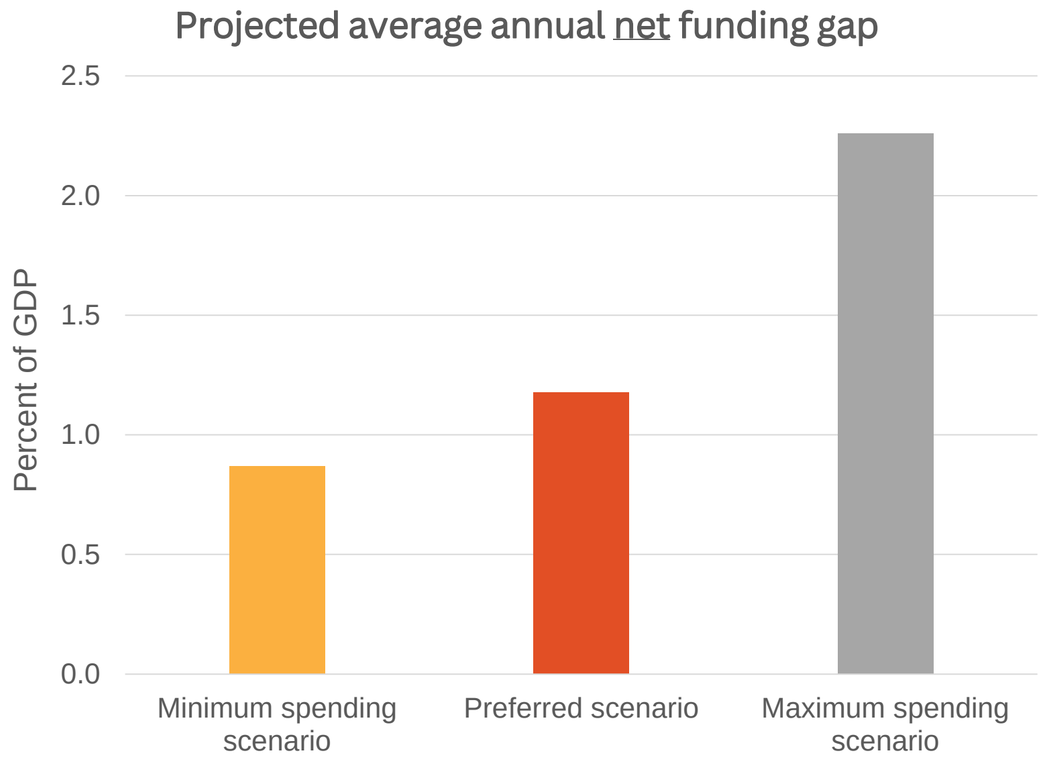
The additional growth until 2030 will not be enough to fund the additional spending





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The government will need to make important decisions to ensure the infrastructure needed to achieve the SDGs is in place

1. The level of ambition and the investments and policies in each sector.

2. How to prioritize among the investments in each sector, but also across sectors.

3. How to close the funding gap—additional tax revenues and revenues from user charges, shifting resources from other sectors?

4. How much of the funding gap will be financed, that is how much current and future generations will contribute to closing the gap.


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