

# REDEFINING THE MINIMUM RESIDENTIAL ROAD RESERVE WIDTH 50 YEARS AGO

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## ABSTRACT

Until about 50 years ago, the road reserve width of local streets serving residential areas in South Africa was usually 16m, accommodating a pavement 5.5 or 6m wide, with the remainder of the reserve undeveloped. This norm was set out in a number of guideline documents published by various public sector authorities.

When the City Council of Cape Town embarked on the extensive Mitchells Plain development, it was decided that many then current engineering and planning norms would be reviewed. The reserve width described above was one of the technical issues scrutinised. Consensus was quickly reached that, for these local residential streets, a 5.5m kerb-to-kerb width, within an 8.5m road reserve, was appropriate.

Just a few years later, the CSIR and Department of Housing "Guidelines for the Provision of Engineering Services in Residential Townships" recommended similar dimensions for minor streets – a significant near-halving of the reserve width generally accepted in South Africa up to that point.

## 1. INTRODUCTION

The road reserve width of local streets in urban areas designed in the 1960s and 1970s was typically 15 or 16 m. As late as 1980, the then Transvaal Provincial Administration (TPA) document "Recommended Guidelines<sup>1</sup> for the Provision of Essential Services to Residential Townships" (TPA, 1980) defined "local streets"<sup>2</sup> as follows:

"These are primarily for access to abutting properties. Characteristics are single carriageways, low speed and low volume<sup>3</sup>. Where crossfall and the topography permit, provision is made for parking off the carriageway. The reserve width shall normally be 16m but may in certain circumstances be reduced to 13m." (TPA 1980: Part I: 5.)

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<sup>1</sup> It is useful to recall the purpose of guidelines such as these. Despite the frequent somewhat loose usage in many of them of the word "standards", they are not mandatory standards which must be enforced across the board. They have a different purpose:

"The aim of these guidelines is to achieve uniformity and acceptable standards of planning, design and construction within practical and economic limits without inhibiting the use of flexible design and construction methods that are functionally adequate, durable and cost-effective under unique conditions." (TPA 1980: "Introduction and Scope")

<sup>2</sup> "Streets" or "roads"? In the literature, in the context of residential areas, the terms appear to be used interchangeably. Even, sometimes, within the same paragraph.

<sup>3</sup> This is further qualified as "residential street (less than 100 vehicles per lane per day)". (TPA 1980, Part I, Section 7: 2)

A 16m reserve would be made up of:

- 7.0m carriageway between kerbs;
- two verges, each 4.5m in width. (TPA 1980: Figure 5)

Only three years later, however, “Guidelines for the Provision of Engineering Services in Residential Townships” (the “Blue Book”) (CSIR and Department of Housing, 1983) recommended that the reserve widths of local streets in urban areas be as little as 8.5m.

How could such a drastic reduction – by nearly half – be justified?

The short answer is: the narrower width had already been tried on a large scale in Mitchells Plain, and had not only been shown to “work” and be wide enough for the typical traffic of a local street, but also to save costs, which savings could be put into improving plot sizes and/or the amenity value and appearance of the streets.

## **2. BACKGROUND**

For more than half a century until the 1970s, the Cape Town City Council programme for housing lower-income people had been one of building houses and flats at minimum cost, some for sale, but the great majority for rental. National housing funds were available only for the building of dwellings and basic services, whereas the Council had been obliged to provide all amenities from its own financial resources. The townships thus created lacked adequate amenities and community facilities – to the considerable dissatisfaction of the residents. Over the years, also, the backlog in provision of low-cost housing had grown steadily.

In terms of the Bantu Affairs Administration Act (South Africa, 1971), responsibility in cities and towns for the administration of and provision of services (including housing) to what were referred to as Black residential settlement areas (specific areas defined in terms of the Group Areas Act (South Africa, 1966)) was taken away from the municipalities, placing this responsibility with newly created Administration Boards. Cape Town was thus left with responsibility for housing its (using categorisations in terms of the racial legislation of the day) Coloured, Indian and White populations whose incomes were insufficient to purchase houses on the open market. Moreover it is crucial to note that whereas all population groups could only purchase in the “group areas” set aside for them, there was a major shortage of supply of significant parcels of land of the “right” group area for Coloured and Indian people.

Surveys conducted by the Council in the early 1970s revealed that thousands of families currently residing in rental accommodation had the financial capacity to purchase higher-quality dwellings. However, as previously noted, due to an inequitable policy, suitable land was in short supply. The Council was thus compelled to make bold decisions. While an exceptionally large housing program, unprecedented in scale, could not significantly alleviate the existing backlog, it had the potential to make a substantial contribution.

Planning studies indicating topographical limitations and the necessity to preserve prime agricultural land such as the highly productive market gardening enterprises on the Cape Flats, which remains vital to this day, identified the area known as Mitchells Plain. Comprising 3100ha located approximately 4km beyond the then limit of urban development, it was available for purchase or expropriation from its current owners. The land included a semi-developed portion owned by a cement manufacturing company and

several parcels of undeveloped land characterized by undulating sand dunes predominantly covered by Port Jackson. Consequently, this area was selected for the development.

An agreement was reached between the City Council and the central government, stipulating that the development of Mitchells Plain would be entirely financed by the central government. Moreover, the development would include all amenities and would be built to concepts of planning which would be largely novel for local authority housing in South Africa. A decision was made to prioritize homeownership, building as much for sale as the market could sustain, with subsequent construction planned for rental housing to similar standards, offering the option to purchase. This approach was expected to complement the predominantly rental housing in existing schemes, fostering upward social mobility.

In 1974, the City Council of Cape Town, as the agency responsible for housing in the municipal area, with financial support from the National Housing Fund, received approval from the central government to proceed with the development of Mitchells Plain.

Planning began with the formation of a multidisciplinary team within the City Engineer's Department. This core team consisted of architects, civil engineers, and planners, with additional support provided on an ad hoc basis by consultants specializing in transportation, sociology, ecology, and other relevant fields. Broader municipal resources were leveraged to supply the necessary expertise, including personnel in water and sanitation, roads and drainage, land surveying, horticulture, information and communication technology (ICT), finance, and electrical and mechanical engineering. Housing administration staff and the City Treasurer's Department were responsible for managing the processes related to allocation, sale, and instalment payments. Furthermore, the team established strong working relationships with the central government and relevant public corporations to ensure the timely provision of essential services such as schools, postal services, health services, rail connections, and trunk roads.

While the higher standard of housing, community amenities, and the built environment, relative to previous subsidized housing projects in South Africa, was primarily made possible by available funding, it is essential to highlight the significant benefits of the deliberate effort to adopt a multidisciplinary approach. This approach included collaboration among all relevant professions. For instance, engineers made concerted efforts to understand the financial and consumer implications of various technical options and were open to working outside the boundaries of their traditional disciplines. This interdisciplinary cooperation undoubtedly played a crucial role, particularly in exploring ways to reduce costs without compromising service levels or achieving better outcomes for the same budget.

A good example of this background to how the "Blue Book" (CSIR and Department of Housing 1983) could with such confidence recommend that the reserve widths of local streets in urban residential areas be reduced from 16m to as little as 8.5m.

### **3. INNOVATION**

Recollection that Mitchells Plain was born in the apartheid era, with all of that era's injustice and its social consequences, has tended to obscure the high level of engineering, town planning and housing innovation that took place in the early years of its development. Whereas initial proposals were for yet further rollout of the mostly rental development of

the Cape Flats which had characterised the preceding couple of decades, the appointment shortly before physical development was due to start of a new team, with a new brief, brought about a complete rethinking of all of the then customary standards for residential development, not just in Cape Town but, in due course, nationally.

Whereas the development as a whole was the responsibility of the Assistant City Engineer (Housing), Mr Denis Mabin, reporting to City Engineer Mr Jan Brand, a driver of change with a proven track record in urban development was needed to head the core planning team. The City decided to look outside its own organisation, and chose architect and planner Mr David Jack, at that time working for Anglo American Properties and responsible for the innovative Marina da Gama development near Muizenberg<sup>4</sup>. He agreed to come on board, starting New Year 1975.<sup>5</sup>

From the start, the core team questioned the norms for inter alia the layouts, the housing types and their marketing, the engineering services (what they ought to be, and where they should be laid), and the community facilities. Benefiting from the strong backing of the City Council and, through providing much of the funding, central government, the project received unprecedented levels of cooperation from the authorities responsible for schooling, health and community facilities, and the rail and bus services.

The topic of road reserve widths serves as an example of how the benefits of this way of working were realised – i.e. cross disciplinary, and in close cooperation with the authorities which would in due course be responsible for the operation and maintenance of anything that would be built.

Up to that time, as codified in “recommended guidelines” such as those of the TPA (TPA 1980), the minimum residential road<sup>6</sup> reserve width, even in low income townships, was of the order of 13m or even 16m. Given that the road pavement itself was seldom wider than 6m (generally 5.5m on the Cape Flats) – if indeed the road was metalled at all – this meant that the verges, more than half of the reserve width, were left as unsurfaced ground. On the Cape Flats, that usually meant that verges became areas of loose windblown sand.

Traditionally the generous road reserve width had been provided against the possible need, however infrequently, to excavate and uncover underground services (which were laid in the verge) at some future date. But the wide verges meant a waste of land which could have been put to a better purpose, and the incurring of costs to maintain the verges. Further, the wide reserves reduced visual coherence between street sides.

The Mitchells Plain team re-evaluated the function of minor roads, recognizing that while their primary role was to provide vehicular access to residential properties, this was not their sole purpose. As articulated in the “Guidelines for Human Settlement Planning and Design” (CSIR and Department of Housing, 2000b), published several years later, a road is “required to serve more than just movement-related activities. Residential streets, for example, offer a neutral territory on which neighbours can meet informally. They can also serve as playgrounds for children in developments where plot sizes are too small for this

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<sup>4</sup> <http://marinadagama.com/Marina-da-Gama/>

<sup>5</sup> In later years he was the driving force behind the highly successful conversion of part of the Cape Town harbour into the Victoria and Alfred Waterfront, and the first Managing Director of the company Victoria and Alfred Waterfront (Pty) Ltd. <https://www.waterfront.co.za/>; [https://en.wikipedia.org/wiki/V%26A\\_Waterfront](https://en.wikipedia.org/wiki/V%26A_Waterfront)

<sup>6</sup> By "residential road" is understood roads onto which housing development fronts, and which provide pedestrian and vehicle access to those houses.

purpose” (p. 19). Roads of this nature are further described as being “concerned with accessibility and the needs of the pedestrian. Vehicular movement may be necessary on these roads, but it is tolerated rather than encouraged and is subject to significant restrictions” (p. 19).

Given this redefined purpose, the question arises: what kerb-to-kerb width is necessary for such streets? Assuming a desirable lane width of 2.7m for a moving vehicle (CSIR and Department of Housing, 2000b:20), and acknowledging that vehicles on minor residential roads would typically be moving at low speeds, a kerb-to-kerb distance of 5.4m would be adequate. It would be reasonable to expect that, should one car be parked along the kerb, the driver of an approaching vehicle, upon noticing an oncoming third car, would voluntarily pause to allow the other to pass, thereby ensuring safe and cooperative navigation of the space.

The Guidelines go even further in prioritizing pedestrian activities, stating that “streets where pedestrian activities are expected to predominate may have only one lane, with provision for passing made at intervals. In this case, the lane width should not be less than 3.1m” (p. 20).

This approach reinforces the emphasis on designing streets as shared, multifunctional spaces rather than solely conduits for vehicular movement.

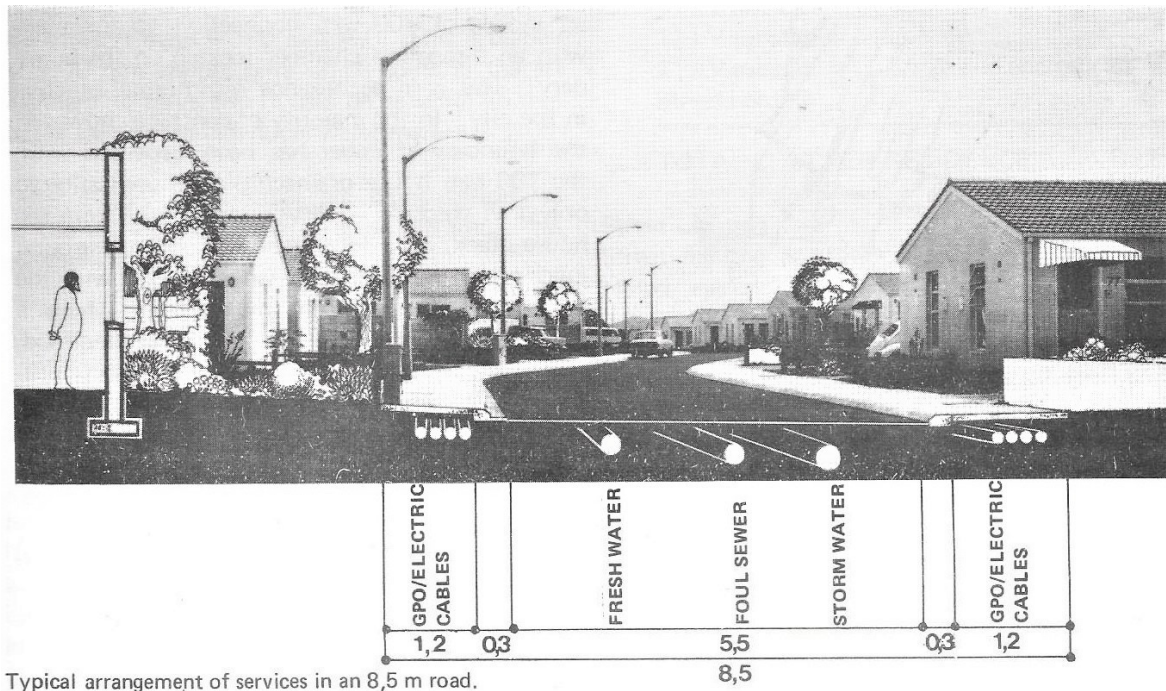
While the Mitchells Plain planning team was deliberating on appropriate street dimensions, a young engineer-planner from the team was tasked with a study of several older residential neighbourhoods in Cape Town. These areas, characterized by street layouts established prior to widespread car ownership, were selected to provide empirical mid-1970s insights into the minimum widths necessary to accommodate low-volume vehicular traffic. His assignment included observing and photographing vehicular circulation and parking arrangements, measuring road reserve widths, and documenting how the remaining portions of the reserve were utilized. He gave particular attention to the placement of essential engineering services, including water supply, sewage, stormwater drainage, and electricity infrastructure.

The study included visiting selected parts of Green Point, Woodstock, Claremont and Wynberg. Many of the observed street reserves in these areas were no wider than 8m, with kerb-to-kerb widths less than 6m, exemplifying a scale that successfully fostered the desired visual relationship between buildings on opposite sides of the street.

Based on these observations and in alignment with the team's broader design philosophy, consensus was reached regarding appropriate street dimensions for minor roads in Mitchells Plain. A kerb-to-kerb width of 5.5m within an 8.5m road reserve was deemed suitable and subsequently adopted as the standard.

Some of the engineering departments of the City were initially against locating services beneath the paved carriageways, citing the need for ease of access – their preference was to situate services under the unpaved verges. However, this stance was challenged by the core team, who argued that service access is infrequent and that narrower road reserves with verges dedicated to public amenity would offer greater long-term community benefit. This rationale led to the eventual dissolution of opposition. Through effective interdisciplinary collaboration it was agreed that, with thoughtful design and construction practices, all underground services could be accommodated beneath the carriageway itself.

The consequent real saving in land and thus in cost was put into larger plot sizes and/or more houses per hectare, surfaced sidewalks and planting within the road reserves. The result was a hierarchy of neat and practical estate streets, the smallest and most frequently encountered of which fitted within 8.5m reserves. At the same time, the town planner's objective of a human scale relationship between the effective height of the buildings and the width of the street was achieved (Figure 1).



**Figure 1: Typical arrangement of services in an 8.5m road (Cape Town 1980:10)**

As anticipated, the adopted carriageway width – measuring a minimum of 5.5m between kerb faces within an 8.5m road reserve – proved adequate for the traffic demands of the residential roads where this cross-section was implemented. An additional benefit of utilizing narrower road reserves was the reduced distance from the underground mains to individual properties, resulting in cost savings associated with house connection infrastructure when compared to the 13m and 16m reserves traditionally used.

On nearly all such roads, mountable kerbs were installed to facilitate vehicular access to parking spaces located on individual plots (erven). To enhance overall accessibility and convenience, supplementary parking was often incorporated at the termini of cul-de-sacs, within small communal areas, and at other strategically selected locations.

The road construction method involved a 38mm dense-graded asphalt premix layer placed atop 150mm of primed gravel or laterite, supported by a compacted sand sub-base. In certain areas, this asphalt layer was substituted with a two-coat chip and spray surfacing as an alternative treatment (City of Cape Town, 1980:9).

A further example of the advantages of interdisciplinary collaboration in the design of residential roads in Mitchells Plain was the provision during the initial construction phase of underground ducting for electricity and telephone infrastructure. At the time, landline telephone ownership in lower-income communities was limited. However, when the planning team engaged with officials from the Department of Posts and Telecommunications (DPT), they discovered that the officials had of their own accord

come to realise that, in many areas, the low ownership of telephones was not because of owner income constraints, but because of low availability of landlines. Aware that waiting lists were prohibitively long, many prospective users had refrained from applying for telephones.

This awareness made DPT officials highly receptive to a proposal to incorporate telephone ducting in the initial construction works. As a result, the ducting infrastructure was installed to each residential unit concurrently with other services and road construction. The outcome of this integrated planning and construction approach was significant: in the early phases of Mitchells Plain's development, given the ready availability of landlines, telephone penetration rapidly rose to over 80 percent.

To ensure the efficient coordination of all civil infrastructure, including roads and underground utilities, a single civil contractor was appointed for each area. These contractors were tasked with executing all construction activities, road and underground services, concurrently.

Finally, it is important to emphasize the remarkable pace of development achieved during the early years of Mitchells Plain's construction. Initiated in 1975, the project had delivered over 16,000 complete houses by the end of 1979, all in accordance with the National Building Regulations. Most of these units were two- or three-bedroom homes, most featuring tiled roofs, with all residences equipped with both hot and cold running water and flush sanitation systems. Over the same period, approximately 125km of tertiary roads and an additional 50km of secondary and primary roads were constructed (City of Cape Town, 1980, pp. 5, 19).

#### **4. INTEREST FROM ELSEWHERE**

News quickly spread within the engineering and planning communities that several long-standing design conventions were being critically re-evaluated – and in some cases, entirely redefined – through the work undertaken in Mitchells Plain. As a result, numerous professionals from across South Africa visited the area to observe firsthand the innovative planning and implementation strategies. Among the most senior of these visitors were Mr. Angus Morris, Deputy Chief Roads Engineer of Johannesburg, and Mr. Alec Hay, Deputy Chief Design Engineer.

The project also garnered significant international interest. In 1979 alone, Mitchells Plain hosted more than 200 foreign visitors who sought to learn from its pioneering approach to residential infrastructure development (City of Cape Town, 1980, p. 15). Additionally, the planning team received a delegation from the Council for Scientific and Industrial Research (CSIR), further highlighting the project's national relevance and influence

#### **5. “BLUE BOOK”**

The experiences outlined above, along with the standards established during the development of Mitchells Plain, were documented at various stages by the planning team. However, these records remained internal to the City Engineer's Department and were not disseminated publicly or formally published. Despite this, the project continued to attract considerable attention, with numerous professional visits over the years.

In early 1984, built environment practitioners across South Africa were informed of a national roadshow organized by CSIR to present its work on the formulation of national

guidelines for the engineering and planning of residential areas. These efforts culminated in the publication of "Guidelines for the Provision of Engineering Services in Residential Townships" (CSIR and Department of Housing, 1983), which became widely known as the "Blue Book" due to the colour of its cover.

Several past and present members of the Mitchells Plain planning team attended the two-day roadshow. By the end of the first day, it was evident how extensively the Mitchells Plain experience had been adopted by the authors of the guidelines. Many of the illustrative photographs displayed during the presentations had clearly been taken at Mitchells Plain. However, despite the significant influence of Mitchells Plain's pioneering work, the project was not mentioned, and no credit was given to the City of Cape Town.

During a plenary session on the second day, one of the team members raised this omission with the CSIR project leader, Mr. Bill Cameron, who immediately acknowledged the contributions of Mitchells Plain and apologised for the oversight. It was the demonstrable success of the innovative design and construction practices employed in Mitchells Plain that had enabled the CSIR to confidently advocate for new guidelines<sup>7</sup> which represented a substantial departure from the existing norms, such as those published by the Transvaal Provincial Administration (TPA, 1980).

## **6. SUMMARY**

The paper describes the need for, and the rationale supporting, a much-reduced minimum residential road reserve width that was pioneered 50 years ago, and which with little delay was incorporated into South African national planning guidelines.

## **7. DEDICATION**

This paper is dedicated to the memory of Mr. Jan Brand, the innovative and dynamic City Engineer of Cape Town during the period under discussion. Later, he also mentored the author. Had he been alive, he would have celebrated his 100th birthday in March 2025.

## **8. REFERENCES**

Cape Town, City Engineer's Department. 1980. "Mitchells Plain: Motivation for the Mitchells Plain project to receive the award of "The most outstanding civil engineering achievement of 1979" of the South African Institution of Civil Engineers". (Prepared on behalf of the Municipal Division of the South African Institution of Civil Engineers by the City Engineer's Department, Cape Town – April 1980).

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<sup>7</sup> The "Blue Book" boldly specifies not just a "5.5m: standard" dimension for "residential access loops", but adds that for the same type of road this can drop to 4.5m as a "basic minimum", although "widening on inner kerb radius may be needed at 90° bends". Moreover:

"The narrow width is a deliberate attempt to restrict speed. ... A 4.5m roadway provides clearance for the largest vehicles, which may be expected only infrequently, and generally outside peak hours. Smaller private vehicles may pass with comfort at the slow design speed which is encouraged on this class of road."

(CSIR and Department of Housing, 1983: B62, B64.)

Note though that although neither of the "Red Books" explicitly recommends 8.5m reserves with 5.5m pavements, these dimensions can really be inferred from the dimensions suggested for elements of the road reserve, starting with the 2.7m minimum lane width. (CSIR and Department of Housing, 2000b:20)

CSIR and Department of Housing. 1983. Guidelines for the Provision of Engineering Services in Residential Townships (Generally known as the “Blue Book”).

CSIR and Department of Housing. (“Compiled under the patronage of the Department of Housing by CSIR Building and Construction Technology”). 2000. Guidelines for Human Settlement Planning and Design (Generally known as the “Red Book”). Available at: <https://researchspace.csir.co.za/items/5398cb1a-145f-4437-b853-527e89b064ec>

In two volumes:

- CSIR 2000a. CSIR Red Book\_Vol1\_2000.pdf (2.85 MB)
- CSIR 2000b. CSIR Red Book\_Vol2\_2000.pdf (4.48 MB)

Department of Human Settlements. 2019. The Neighbourhood Planning and Design Guide.

<https://www.csir.co.za/neighbourhood-planning-and-design-guide-red-book> or <https://www.dhs.gov.za/DHS%20Red%20Book>

(Same as its most recent predecessor, of which it is a comprehensively updated and revised version, it is generally known as the “Red Book”.)

South Africa. 1966. Group Areas Act, Act 36 of 1966. South Africa: Government Printer.

South Africa. 1971. Bantu Affairs Administration Act, Act 45 of 1971. South Africa: Government Printer.

Transvaal Provincial Administration. 1980. Recommended guidelines for the provision of essential services to residential townships.