

Five-Year Outlook on Childcare Capacity Needs Across Singapore

A Data-Driven Approach to Prioritising Preschool Planning and Investment

Prepared for: Early Childhood Development Agency (ECDA)

Executive Summary

Over the next five years, childcare demand will be concentrated in a small number of fast-growing residential subzones. A data-driven planning tool can help ECDA prioritise where new preschools are most urgently needed, while avoiding overreaction to data gaps.

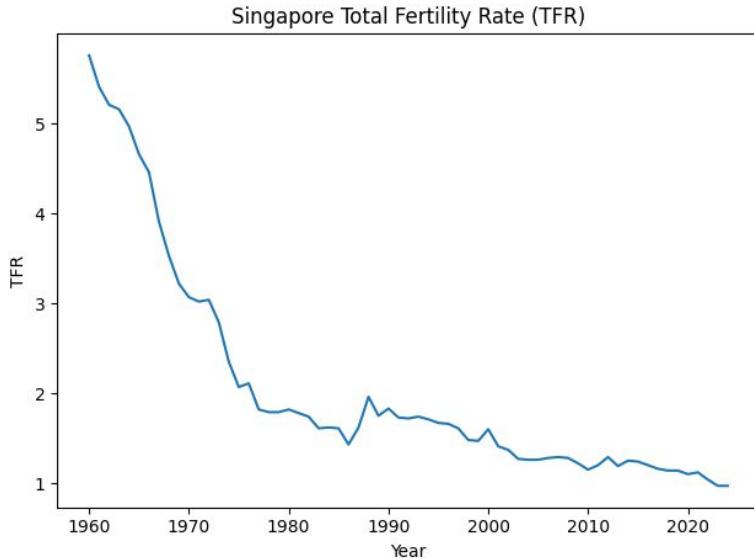
- By 2025, several subzones are projected to require **10 to 25 additional childcare centres** compared to 2020.
- Demand growth is **highly concentrated in new and redeveloping estates**, particularly in the East and North-East.
- Forecast accuracy is strong for most subzones, a small number of volatile or low-base areas require policy review.
- The proposed approach can be operationalised as an **efficient and repeatable planning tool**, not a one-off analysis.

Policy Context and Planning Question

ECDA's planning challenge is not national-level childcare demand, but **where and when capacity mismatches will emerge**. Despite sustained investment, shortages persist in specific estates due to uneven population growth, housing development timelines, and demographic redistribution.

Planning Question	Assumptions
Which subzones should ECDA prioritise for building or relocating childcare centres over the next five years?	<ul style="list-style-type: none">• Childcare demand proxied using resident child population• Planning norm: 100 children per centre• Five-year horizon aligned with medium-term infrastructure planning cycles

Demographic Backdrop: Why Demand Still Matters



Singapore's Total Fertility Rate (TFR) has been on a long-term decline. However, this masks **significant spatial redistribution of families**, particularly into new and redeveloped estates. As a result, localised demand pressures remain material, even as national fertility stabilises at low levels.

- Declining TFR does **not** eliminate the need for childcare expansion.
- Planning must focus on **where children live**, not national averages.

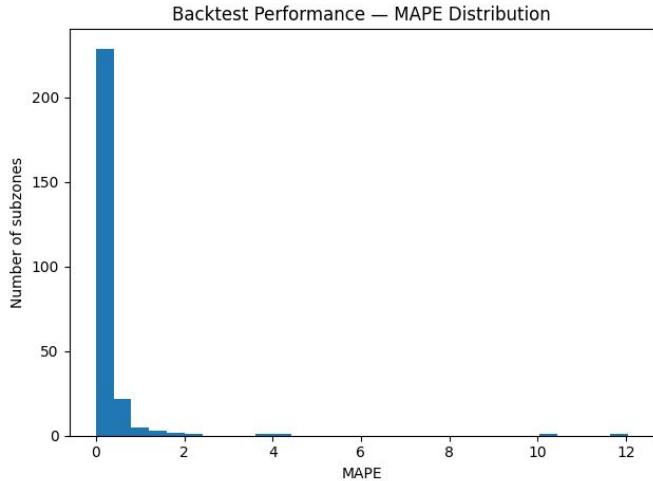
Data and Methodology

We combine historical child population trends with upcoming housing supply information to forecast future childcare demand at the subzone level. Each subzone is modelled independently to capture local growth dynamics.

Method Summary

1. Annual child population aggregated at subzone level.
2. Time-series forecasting used to project demand five years forward, constrained to be non-negative.
3. Where recent baseline data is missing for a small number of subzones, the most recent historical observation is conservatively carried forward to avoid understating existing capacity.
4. Demand translated into required centres using ECDA's planning norm.
5. Future demand adjusted for upcoming BTO completions.
6. Results compared against existing baseline capacity.

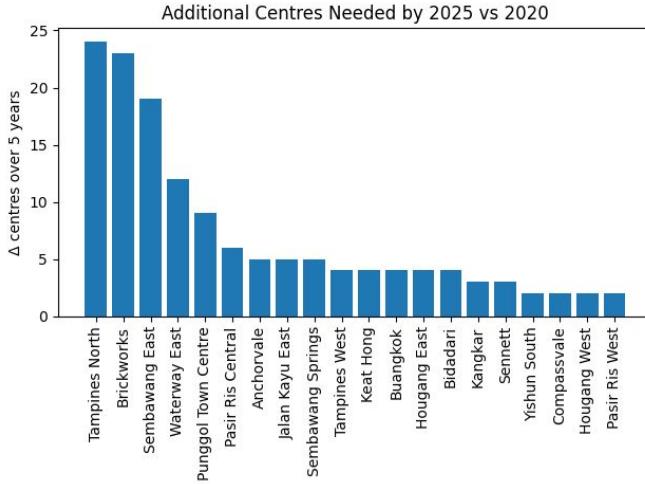
Forecast Reliability and Model Performance



Before using the forecasts for planning, we evaluated historical accuracy through backtesting. Most subzones exhibit very low forecast error, indicating stable and predictable demand patterns. A small number of outliers reflect areas with very low historical bases or rapid structural change.

- Median forecast error is below **1%**, indicating high reliability for most subzones.
- Errors are tightly clustered near zero, with a small right tail.
- Forecasts are suitable for **decision support**, not automated approvals.

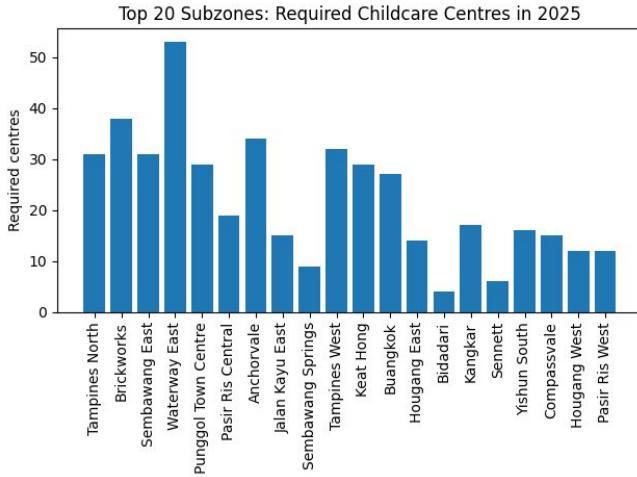
Where Capacity Gaps Will Grow Fastest



Comparing 2020's estimated capacity with five-year projections highlights where shortages will intensify if no new centres are added. Growth is uneven, where a small number of subzones account for a disproportionate share of incremental demand.

- Growth is led by **new and redeveloping estates** such as Tampines North, Brickworks, and Sembawang East.
- Several mature estates also show steady incremental pressure.
- This ranking provides a **clear prioritisation list** for intervention.

Absolute Demand Hotspots in 2025



Beyond growth, ECDA must also consider absolute scale. Some subzones require many centres simply due to population size, even if growth rates are moderate.

- Planning should balance **growth-driven strategies** with **large absolute demand**.
- These areas are natural candidates for (1) larger centres, (2) clustered developments, and (3) co-location with community facilities.

Priority Subzones: Planning Table

By combining baseline demand, projected demand, and incremental needs, we derive a practical planning shortlist for action.

Subzone	Total Centres Needed by 2025	Additional Centres Needed Over 5 Years
Tampines North	31	24
Brickworks	38	23
Sembawang East	31	19
Waterway East	53	12
Punggol Town Centre	29	9

What This Means for ECDA Planning

This analysis enables ECDA to move from reactive responses to proactive, spatially targeted planning.

Implications

- Earlier alignment of land and infrastructure planning with demand hotspots.
- More precise targeting of interim solutions, such as temporary centres.
- Clearer trade-offs between relocation, expansion, and new builds.

From Analysis to a Living Planning Tool

Beyond this exercise, the same logic can be operationalised as a lightweight planning tool that refreshes priorities whenever new data is available. The design deliberately mirrors the original analysis workflow to ensure transparency and traceability. This tool supports prioritisation decisions, and final siting and investment choices remain subject to land availability and policy considerations.

Inputs	Core Logic	Outputs	Design Principle
<ul style="list-style-type: none">Latest subzone-level child population dataBTO completion pipeline (optional)Planning parameters (centre capacity, take-up rate, forecast horizon)	<ul style="list-style-type: none">Annual ETS demand forecasts per subzoneBackfilling for subzones missing latest-year dataOptional BTO-driven demand upliftDeterministic mapping from demand into required centres	<ul style="list-style-type: none">Plan-year demand and required centres by subzonesRanked subzones by projected capacity pressure	<ul style="list-style-type: none">RepeatableTransparentSupports human planning judgement

Limitations and Sensitivities

Limitations	Mitigation
<ul style="list-style-type: none">• Assumes historical trends remain broadly stable• Sudden policy or migration shifts are not explicitly modelled• Uniform centre capacity assumed across all subzones	<ul style="list-style-type: none">• Regular data refreshes• Scenario testing for high-growth estates• Expert review for outlier subzones

Improvements with More Time and Resource

- Integrate centre-level utilisation and waitlist data.
- Model alternative take-up scenarios (high/medium/low).
- Incorporate land availability and redevelopment constraints.
- Add confidence intervals around centre requirements.

Discussion Questions

- Are there estates where relocating under-utilised centres from lower demand areas is preferred over new builds?
- How flexible is the 100 children per centre planning norm in practice?
- Should planning optimise for peak demand or average utilisation?