

Tesbury: Site Selection & Sales Drivers — One■Pager

****Goal:**** Pick the best store location under multiple criteria (space, security, accessibility, customer reach, ****cost****) and model weekly sales drivers across existing stores.

****Data:**** `Sales.csv` — weekly sales with macro features (Fuel_Price, CPI, Temperature, Unemployment).

What we did

- ****Multi■criteria decision modeling****: built ****WSM**** and ****TOPSIS**** scenarios to compare four alternatives (A1 Centre, A2 Suburbs, A3 Shared, A4 Extend).
- ****Sensitivity analysis****: swept ****Cost weight (C5)**** and feature importance factors to reveal tipping points.
- ****Store■level regression****: OLS per store + overall model; validated with ****Actual vs Predicted**** and confidence bands.

Key findings (from figures)

- ****Site choice****
 - ***Scenario 1 (Cost 50%)*** → ****A4 Extend**** best overall.
 - ***Scenario 2 (Space/Security x2)*** → ****A2 Suburbs**** rises to #1.
 - ***Scenario 3 (24/7 constraint)*** → ****A2 Suburbs**** wins (****TOPSIS**** closeness highest).
- ****Tipping points****
 - ***S1***: Rankings stable across cost weights (A4 holds #1).
 - ***S2***: Results robust as space/security importance increases.
 - ***S3***: ****Tipping ~0.24**** on cost weight moves rank order (see S3 rank plot).
- ****Sales drivers****
 - ****Fuel_Price**** has the largest absolute effect magnitudes (store■specific).
 - ****CPI**** and ****Temperature**** show moderate effects; ****Unemployment**** varies by store.
 - Overall model fits well (tight Actual vs Predicted cloud by store cluster).

Outcome

- Recommended ****A2 Suburbs**** when 24/7 feasibility is enforced; otherwise ****A4 Extend**** under cost■priority assumptions.
- Clear explanatory visuals + scripts enable scenario re■runs in minutes.

****Stack:**** R (tidyverse, ggplot2), MCDA (WSM/TOPSIS), OLS.

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