

Supplementary Materials

Table S1 reports BH-adjusted p-values by horizon for the paired significance tests (with-graph vs. no-graph) on UrbanEV.

Table S1. UrbanEV paired significance tests by horizon (with-graph vs. no-graph).

	horizon	p_{raw}	p_{BH}
0	0	7.488097e-47	2.111913e-46
1	1	7.823062e-47	2.111913e-46
2	2	1.172163e-46	2.111913e-46
3	3	1.793594e-46	2.111913e-46
4	4	1.978345e-46	2.111913e-46
5	5	2.111913e-46	2.111913e-46

To address the concern that conclusions should not rely on a single static prior, Table S3 further reports UrbanEV results under alternative predefined graphs, including a distance-based kNN prior ($\mathbf{A}_{dist}$) and a correlation-based top-k prior ($\mathbf{A}_{corr}$), complementing the diagnostics in Table S2 and the main results in Table 4.

Table S2. Graph mismatch diagnostics ($\Delta corr$ and E_D) on the training split.

Dataset	Graph	$\Delta corr$	E_D
UrbanEV	predefined adj.csv (sym-normalized)	-0.0436	442,596.06
CHARGED-AMS_re-move_zero	kNN distance (k=8) + Gaussian, sym-normalized	0.0009	831.13

Table S3. UrbanEV performance under alternative predefined static graph priors (h=6).

Notes: Mean $\pm$ std over S=5 seeds (0-4) for STGCN variants; Persistence is a point estimate under the same split. A_{dist} is the kNN distance graph (k=8) and A_{corr} is the top-k Pearson-correlation graph (k=8) constructed on the training split.

Model	MAE	RMSE	NMAE	NRMSE	WAPE
STGCN (A_{data} ; predefined adj.csv)	116.205 $\pm$ 5.426	393.735 $\pm$ 32.784	0.496 $\pm$ 0.023	1.680 $\pm$ 0.140	0.496 $\pm$ 0.023
STGCN (A_{dist} ; kNN distance, k=8)	106.273 $\pm$ 5.010	356.333 $\pm$ 15.694	0.454 $\pm$ 0.021	1.521 $\pm$ 0.067	0.454 $\pm$ 0.021
STGCN (A_{corr} ; top-k Pearson corr, k=8)	102.169 $\pm$ 4.451	352.755 $\pm$ 29.251	0.436 $\pm$ 0.019	1.506 $\pm$ 0.125	0.436 $\pm$ 0.019
STGCN (no graph; A=I)	66.529 $\pm$ 1.705	283.217 $\pm$ 7.987	0.284 $\pm$ 0.007	1.208 $\pm$ 0.034	0.284 $\pm$ 0.007
Persistence	94.156	472.401	0.402	2.016	0.402