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Why Automation and AGV Projects Fail Due to Caster

One-page quick reference · Full engineering guide + live tools at the QR codes below

Quick answer. AGV and automation projects fail on seven caster selection errors: reusing manual-cart casters, wrong durometer, standard kingpin swivels, mixed wheel diameters, under-capacity sizing, wrong wheel material, and skipping concentricity spec. Manual-cart casters tolerate 0.030 to 0.060 inch runout; AGV navigation does not. Each error costs \$5,000 to \$150,000 before it is diagnosed.

The seven errors in one paragraph

#	Error	Typical cost	Where it hurts
1	Reusing cart casters on AGV retrofit	\$20K–\$100K	Navigation drift, recalibration labor
2	Wrong wheel durometer	\$10K–\$40K	Rolling resistance variance, drive saturation
3	Standard kingpin swivel	\$15K–\$60K	Lateral offset at tread, sensor jitter
4	Mixed wheel diameters	\$8K–\$25K	Cant at platform, sensor mis-calibration
5	Under-capacity sizing	\$25K–\$150K	Flat-spot, concentricity loss, recalibration
6	Wrong wheel material for floor	\$10K–\$50K	Short service life, floor damage
7	Skipping concentricity spec	\$5K–\$30K	Cyclic navigation disturbance

Error 2 — Wrong wheel durometer

Wheel material	Rolling resistance variance	Vibration	AGV fit
Solid rubber / TPR	High ($\pm 25\text{--}30\%$)	Low	Poor
Polyurethane 85A	Moderate ($\pm 15\%$)	Low	Marginal
Polyurethane 92–95A on forged core	Low ($\pm 5\%$)	Low	Excellent
Cast iron / forged steel	Very low	High	Poor (sensor noise)
Phenolic	Moderate	Moderate	Acceptable (high-heat)



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