

Carpenters

AI touches carpentry mainly through design software, estimating and site apps; cutting, fitting and finishing remain hand and eye work.

EXPOSURE	WINDOW	ADOPTION TODAY	READING
8 Low exposure	7–15 yrs until change lands	Low	AI assists; the work stays human-led. Exposure is the share of today's work AI can plausibly take on within the window.

§ 01WHAT IS HAPPENING

What is happening to carpenters

Impact

Generative AI has little purchase on the physical core of carpentry: framing, forming, fitting, trimming and fixing problems that the drawings did not anticipate. Where it appears is upstream and around the edges: CAD and modelling tools such as SketchUp and Autodesk Fusion generate cut lists and layouts, estimating software drafts quotes, and site platforms like Procore and Buildertrend handle scheduling and documentation. In joinery shops, CNC saws and routers driven by software already cut components that were once marked and cut by hand. For most carpenters the day looks much as it did, with more of the planning and paperwork done on a screen.

Risk

Minimal transformation; AI speeds planning and off-site cutting while the on-site craft stays firmly human.

Occupation-level measures place carpenters in the lowest official exposure tier, with observed AI usage at zero and task applicability very low; the score is low because the measured generative-AI exposure is low. The tasks that shift are measuring and cut-list preparation, quoting and scheduling, which software can draft from a model, and some component production that moves to CNC-equipped shops. Fitting work on a real building, with its out-of-square walls and site changes, stays with the carpenter, as does the judgement about materials, finish and sequence. Over a 7-15 year window the plausible change is a slow move of repetitive cutting into factories and robots, more model-based instructions on site, and a carpenter whose value is in installation quality and problem-solving rather than in volume of cuts.

Sector readiness

Low Adoption Outside Offsite Manufacturing

Published adoption ratings for the occupation are low. Large builders and offsite timber-frame manufacturers use design-to-CNC workflows and project platforms, but the typical carpentry business is a small firm whose technology is a laser measure, a phone and perhaps an estimating app. AI-generated quotes and cut lists are spreading slowly, mostly through software the carpenter already owns.

§ 02 POSITION

Where you stand

- i Position yourself as the carpenter who can read a model, generate a cut list and still make the job fit on an out-of-square site.
- ii Specialise in finish carpentry, heritage work or complex fit-outs where tolerance, judgement and craft are the product and automation has little to offer.
- iii Learn the design-to-CNC workflow so you can run a joinery shop or an offsite line rather than compete with it.

§ 03 ACTIONS

6 POINTS

What this means for you

Concrete changes to how the work gets done, in the order you are likely to meet them.

- 01 **Learn to read the model.** More sites hand carpenters tablets with 3D models instead of paper. Being fluent in viewing and querying them saves time and avoids mistakes.
- 02 **Let software price the job.** Estimating tools and assistants such as ChatGPT can draft a quote or a materials list quickly; check it, then spend the saved time on the client.
- 03 **Get comfortable with CNC.** Shop-cut components are becoming the norm for framing and cabinetry. Knowing how they are programmed makes you more useful on both sides.
- 04 **Document as you go.** Site platforms expect photos and logs at each stage. It protects you in disputes and is now part of being a professional.
- 05 **Specialise where machines struggle.** Renovation, restoration, stairs and bespoke fit-outs reward judgement and hand skill that no robot is close to matching.
- 06 **Keep your tool knowledge current.** Laser layout, digital levels and track saws are the near-term productivity gains; they matter more than any AI model does for your day.

§ 04 CAUSES

6 DRIVERS

What is pushing this change

- 01 **Design-to-fabrication software.** CAD and BIM tools generate cut lists, layouts and CNC files directly, removing much of the manual take-off and marking out.
- 02 **Offsite and modular construction.** Timber frames, trusses and cabinetry are increasingly cut and assembled in factories with automated saws and framing lines, shifting work away from site.
- 03 **Site management platforms.** Procore, Buildertrend and Fieldwire digitise scheduling, documentation and change orders that carpenters must now interact with.
- 04 **AI estimating and quoting.** Assistants and estimating apps draft quotes, material lists and client emails, cutting the admin burden on self-employed carpenters.
- 05 **Layout and measuring technology.** Robotic total stations, layout robots and laser scanners reduce manual measuring and set-out on larger projects.
- 06 **Skilled labour shortages.** Shortages of qualified carpenters sustain demand and wages even as some repetitive tasks move to machines.

Impact by sector

The headline figure is an average. Where you work changes the picture.

Residential building and renovation	Low AI use; the work is varied and site-specific, and the main changes are estimating apps and more pre-cut components arriving from suppliers.
Commercial fit-out and formwork	Larger projects bring model-based layout, site platforms and more prefabricated elements, so carpenters here work with more technology.
Joinery and cabinet making	CNC routers and design software already automate much of the cutting; the shop carpenter's role is shifting towards programming, assembly and finishing.
Offsite timber-frame manufacturing	Automated framing lines and robotic nailing are in use, making this the most automated setting a carpenter is likely to encounter.

Skills to build

The skills that keep the human part of this work valuable as the routine part is automated.

- 01 Model and drawing literacy.** Reading BIM models and digital drawings on a tablet is becoming standard on larger sites; practise with free viewers and ask to see the model on your next job.
- 02 CAD and cut-list software.** SketchUp, Fusion or cabinet software let you design, price and produce CNC-ready files; it is the bridge between site and shop work.
- 03 Finish and fitting craft.** Scribing, hanging doors, stairs and trim in imperfect buildings is the part machines cannot do; keep refining it.
- 04 Estimating and client communication.** Quick, accurate quotes and clear communication win work; use AI assistants to draft and your knowledge to check.
- 05 CNC and machine operation.** Understanding how automated saws and routers are set up opens roles in joinery shops and offsite factories.
- 06 Problem-solving on site.** Adapting a plan to what is actually there is the core of the trade and the clearest reason the work stays human.

Tools in use

KINDS OF TOOL WORTH KNOWING

- 01

Dusty Robotics. Layout robot that prints wall and framing lines on the slab from the model, replacing manual set-out on large projects.
- 02

Automated framing lines. Robotic wall-panel and truss assembly systems used in offsite factories to cut and nail components from the model.

NAMED TOOLS ALREADY IN USE

SketchUp	VISIT
3D modelling tool widely used by carpenters and joiners to design, visualise and produce cut lists for projects.	
Buildertrend	VISIT
Construction management software used by residential builders and subcontractors for scheduling, change orders and client communication.	
Procore	VISIT
Project platform on commercial sites where carpentry crews receive drawings, tasks and RFIs.	
Autodesk Fusion	VISIT
CAD/CAM software used in joinery shops to design components and generate CNC toolpaths.	

In practice

Ways people in this role are already using AI, and what they get from it.

Model-generated cut list EXAMPLE 1	HOW	A carpenter models a deck or roof in SketchUp and exports a cut list and material order, then checks it against site measurements.
	GAIN	Faster quoting and less waste from miscounted material.
Shop-cut framing packages EXAMPLE 2	HOW	Wall panels and roof trusses arrive pre-cut and labelled from a CNC-equipped factory, and the site crew assembles and fixes them to the model.
	GAIN	Shortens framing time and reduces on-site cutting and error.
AI-drafted quotes EXAMPLE 3	HOW	A self-employed carpenter dictates job notes into ChatGPT or an estimating app, which drafts a structured quote and a client email for review.
	GAIN	Evening paperwork takes minutes instead of an hour, and clients get a professional document.

§ 09

CONTEXT

How this role compares

Three neighbouring roles chosen to show the direction of travel.

Machinists and CNC Operators MORE EXPOSED	AI IMPACT Automated tool-path generation and lights-out machining are reducing the manual programming and tending work. WORK MOVES TO Operators are shifting to multi-machine supervision, quality and programming.
Construction Managers DIFFERENT SKILLS, GROWING	AI IMPACT AI handles scheduling, progress tracking and risk flagging, freeing managers for coordination and client work. WORK MOVES TO Project leadership, contracts and stakeholder management with strong demand.
Electricians COMPLEMENTARY, LESS EXPOSED	AI IMPACT AI assists with diagnostics and design but the installation and testing remain manual and licensed. WORK MOVES TO Hands-on, regulated trade with growing demand from electrification.

§ 10

VERDICT

Closing judgement

If you are a carpenter, the measured AI exposure for your trade is close to the floor, and nothing in the evidence suggests that changes quickly. The real shifts are modelling tools that hand you cut lists, factories that pre-cut more of the frame, and site apps that want everything photographed and logged. Lean into the parts that cannot be sent to a factory: fitting, finishing, repair and the ability to make an imperfect building look right. Learn enough of the software to read a model and price a job quickly, and the trade will keep paying.

Evidence and revisions

What the exposure figure rests on, what changed when it was last revised, and the published work cited for this role.

SCORE

8

WINDOW

7-15 years (unchanged)

The 5 October 2026 review held the score.

Exposure Index v2. Inputs: task applicability 11/100 (Microsoft AI applicability score 0.06 for Carpenters); observed usage 0/100 (Anthropic observed exposure 0.00); official exposure tier 10/100 (BLS: low); labour-market trajectory not yet mapped for this occupation, so its weight was spread across the other inputs; published adoption rating 10/100 (low adoption). Weighted base 8.2. Final score 8. New report: the window of 7-15 years is set from the score band.

HOW THE FIGURE IS BUILT (EXPOSURE INDEX V2)

Task applicability — Microsoft Research, AI applicability score	11 × 39%	4.3
Observed usage — Anthropic Economic Index, observed exposure	0 × 22%	0.0
Official exposure tier — US BLS AI-exposure category	10 × 22%	2.2
Labour-market trajectory — US BLS projected employment change 2025–35	not measured	—
Published adoption rating — This report’s adoption level	10 × 17%	1.7
Weighted base		8.2
Exposure score		8

MEASURES BEHIND THE SCORE

US Bureau of Labor Statistics · *Employment Projections 2025–35 and AI Exposure Categories* (27 August 2026)
AI-exposure tier: Low. Projected employment change not yet mapped for this occupation. Matched to Carpenters.

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Microsoft Research · *Working with AI: Measuring the Applicability of Generative AI to Occupations* (10 July 2025)
AI applicability score 0.06 for SOC 47-2031; scaled to 11/100 as the task-applicability input.

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Anthropic · *Anthropic Economic Index report: Cadences* (26 June 2026)
Observed exposure 0.00 for SOC 47-2031; scaled to 0/100 as the observed-usage input.

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UK Department for Science, Innovation and Technology · *Assessment of AI capabilities and the impact on the UK labour market* (28 January 2026)
UK context: around 70% of UK workers are in occupations with tasks AI could perform or enhance, above the US average; a one-standard-deviation rise in exposure was associated with a 3.9% fall in UK job postings.

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<https://www.careerguard.ai/sources>

§ 12 APPENDIX

Method and sources

Each report was written from a large body of published research. The exposure score itself is computed, not written: it is the CareerGuard Exposure Index, a weighted average of occupation-level measures from the US Bureau of Labor Statistics (AI-exposure classification and 2025–35 projections), Microsoft Research (AI applicability scores) and Anthropic (observed exposure), together with the adoption rating published on the report. The organisations and publications below are the standing literature behind the narrative sections. Every source, with dates, licences and archived copies where we are permitted to hold them, is catalogued in the research library.

Exposure Index v2 (October 2026). Each input is scaled to 0–100 and weighted: task applicability 35% (Microsoft AI applicability score ÷ 0.5), observed usage 20% (Anthropic observed exposure ÷ 0.75), official exposure tier 20% (BLS very high = 100, high = 70, moderate = 40, low = 10), labour-market trajectory 10% ($50 - 2.5 \times \text{projected \% employment change}$), published adoption rating 15% (very high = 85, high = 70, medium-high = 55, medium = 40, low-medium = 25, low = 10). Inputs not measured for an occupation are dropped and the remaining weights renormalised. An editorial adjustment of at most ± 12 points is allowed only for automation channels the measures cannot see (robotics, self-service, machine vision, medical imaging, RPA/OCR, generative video) and is always logged with its reason. Scores are whole numbers, not rounded to five. The change window shifts one notch (a year at each end) per ten points of movement.

I GLOBAL AND MACROECONOMIC IMPACT OF AI ON WORK

World Economic Forum

The Future of Jobs Report series — Employer survey of expected job growth and decline, skill shifts and technology adoption (2020, 2023 and 2025 editions); *Artificial Intelligence and the Future of Entry-Level Work* (2026).

AI governance and transformation reports — Frameworks on ethical AI, talent strategy and industry transformation.

McKinsey Global Institute

AI, Automation and the Future of Work series — Research quantifying automation potential by task, sector and demographic, from "Jobs Lost, Jobs Gained" to "Agents, robots, and us" (2025).

Industry-specific reports — Financial services, healthcare, manufacturing and others.

PwC

Global AI Jobs Barometer — Annual analysis of job postings and productivity by AI exposure (2024–2026 editions).

Upskilling Hopes and Fears survey — Employee perceptions and readiness.

Microsoft Research and Anthropic

Working with AI (2025); *Anthropic Economic Index* (2025–2026) — Occupation-level usage data from Copilot and Claude conversations, the two observed-usage measures behind the 2026 revision.

Stanford Digital Economy Lab and Stanford HAI

Canaries in the Coal Mine? (2025–2026); *AI Index Report (annual)* — Payroll evidence on early-career employment in exposed occupations; annual measurement of AI capability, investment and adoption.

Deloitte

Human Capital Trends series — Workforce, talent and HR technology trends.

Tech Trends series — Emerging technologies and their business implications.

Accenture

Technology Vision series — Forward-looking analysis of emerging technology, with emphasis on AI.
Fjord Trends — Design, innovation and human experience in a digital world.

Boston Consulting Group

AI/ML insights and industry solutions — "The AI Revolution in the Workplace" and related research.

EY

AI and workforce reports — Adoption, talent strategy and ethics.

IBM Institute for Business Value

AI and automation studies — Business models, workforce evolution and leadership.

OECD

AI Policy Observatory — International data and policy on AI, labour markets and skills.
Employment Outlook — Labour-market trends including technological impact (2023–2026 editions).

International Labour Organization

Generative AI and Jobs: A Refined Global Index of Occupational Exposure (2025) — Task-level exposure gradients for every ISCO occupation; successor to the 2023 global index.

International Monetary Fund

Staff Discussion Notes on AI and work (2024, 2026) — Complementarity framing: where AI augments and where it substitutes.

UK Department for Science, Innovation and Technology

Assessment of AI capabilities and the impact on the UK labour market (2026) — UK occupational exposure and job-posting evidence.

Brookings Institution

AI and automation research — Economic and social implications, displacement and skills.

Yale Budget Lab and Goldman Sachs Research

Tracking the Impact of AI on the Labor Market; AI and the US labour market (2026) — Aggregate labour-market monitoring; macro displacement estimates.

Oxford University (Oxford Martin School)

The Future of Employment — Frey & Osborne and subsequent research on susceptibility to automation.

MIT Technology Review

AI & Work — Reporting on AI research and its implications for industries and jobs.

Gartner

Hype Cycle for Artificial Intelligence — Maturity and adoption of AI technologies.
Future of Work reports — Workplace models and talent strategy.

U.S. Bureau of Labor Statistics

Employment Projections 2025–35; AI Exposure Categories; Occupational Outlook Handbook — Ten-year employment projections and, from the 2025 cycle, an AI-exposure tier for every detailed occupation.

Indeed Hiring Lab

AI at Work Report (2025) and posting-market updates — Skill-level transformation estimates and job-posting trends by occupation.

II CORE AI AND MACHINE-LEARNING RESEARCH**OpenAI**

Research papers, blog and API documentation — Large language models, generative AI, safety and societal impact.

Google DeepMind

Research papers and blog — Reinforcement learning, AI for science, AGI and ethics.

Meta AI

Research papers and blog — Large language models, computer vision, AI for social good.

Hugging Face

Transformers library and model hub — Open-source state-of-the-art NLP models.

TensorFlow and PyTorch

Documentation and community forums — Core frameworks illustrating practical capability.

arXiv

cs.AI, cs.LG, cs.CV, cs.CL — Pre-print research.

NeurIPS and ICML

Conference proceedings — Top-tier academic research.

ACM and IEEE

Journals and proceedings — ACM Computing Surveys; IEEE Transactions on AI.

Kaggle

Datasets and competition solutions — Applied machine learning on real-world problems.

The Alan Turing Institute

Research and reports — Responsible and applied AI.

III ETHICAL AND RESPONSIBLE AI DEPLOYMENT

NIST

AI Risk Management Framework — Voluntary framework for managing AI risk.

European Commission

AI Act — Risk-tiered legal framework for AI.

Ethics Guidelines for Trustworthy AI — Principles for responsible development.

Partnership on AI

Research and best practice — Responsible AI development.

AI Now Institute

Annual reports — Social implications: power, inequality, rights.

ACM FAccT

Proceedings — Fairness, accountability and transparency.

Data & Society

Publications — Social implications of data-centric technology.

WIPO

Conversation on IP and AI — Intellectual-property implications of AI.

IEEE Global Initiative on Ethics of A/IS

Ethically Aligned Design — Recommendations for ethical AI design.

Center for AI and Digital Policy

Policy briefs — Accountable AI policy.