NEW BRUNSWICK ELECTRICAL

Wiring & Rewiring

Knob and tube, aluminum wiring, rewiring, and wire sizing

16 Expert Answers from Electric IQ

newbrunswickelectrical.com/construction-brain

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Q1

Romex vs BX cable — which should I use?

For most residential applications in New Brunswick, Romex (NMD90) cable is the standard choice, while BX (armored cable) is required in specific situations where physical protection is needed.

The choice between these cables depends on your installation location and New Brunswick's adoption of the Canadian Electrical Code. **Romex cable** (technically called NMD90 in Canada) consists of insulated conductors wrapped in a plastic sheath. It's less expensive, easier to install, and perfectly suitable for most indoor residential wiring - running through walls, attics, and finished basements where it's protected from physical damage.

BX cable (armored cable or AC90) has a flexible metal armor covering that provides superior physical protection. Under TSANB requirements, you'll need BX in exposed locations like unfinished basements, garages, workshops, or anywhere the cable could be subject to physical damage. The metal armor also provides better protection against rodents - a real consideration in rural New Brunswick properties.

Cost and installation differences are significant. Romex typically costs 30-40% less than BX and installs much faster since you don't need to cut the metal armor or install protective bushings. However, BX provides electromagnetic shielding and is often preferred for sensitive electronics or areas with high electrical interference.

TSANB code requirements in New Brunswick mandate armored cable in specific locations: exposed runs in unfinished areas, commercial applications, and anywhere subject to physical damage. For standard residential wiring inside walls and finished spaces, Romex meets all code requirements and is the economical choice.

Installation considerations matter too. BX requires special cutting tools and anti-short bushings to protect conductors from the sharp metal edges. Romex simply strips away with a utility knife. However, only licensed electricians should be installing either type - most wiring work requires TSANB permits and professional installation.

For your specific project, the location determines the choice. Kitchen and bathroom circuits inside walls? Romex is fine. Running cable along basement ceiling joists or in a detached garage? BX is likely required. Your electrician will know the specific TSANB requirements for your installation location.

Need help finding a licensed electrician to properly install either cable type? New Brunswick Electrical can match you with local professionals who understand TSANB requirements and will pull the proper permits for your project.

Q2

What low-voltage wiring to include in a reno?

Planning low-voltage wiring during your renovation is smart — it's much cheaper and easier to run these cables when walls are open. Here's what to consider for a future-ready home in New Brunswick.

Essential Low-Voltage Systems

Ethernet/Network Wiring is the foundation of modern homes. Run Cat6a cable to every room where you might need internet — bedrooms, home office, living areas, and basement. Even with Wi-Fi everywhere, hardwired connections provide faster, more reliable internet for work-from-home setups, gaming, and streaming. Plan for at least two ethernet drops per room, with extra runs to areas where you might add smart TVs or mesh network access points.

Coax cable remains important for cable TV and internet service. Many New Brunswick homes still rely on coax for internet from providers like Rogers or Bell, so include coax runs to main living areas and bedrooms. Even if you're streaming-only now, future buyers may want traditional cable options.

Security system pre-wiring should include door/window sensor wiring and camera locations. Run 18-2 or 22-4 wire to all exterior doors, main floor windows, and potential camera mounting points around your home's perimeter. With New Brunswick's rural areas and seasonal properties, security systems are increasingly popular.

Smart Home Infrastructure

Consider **smart thermostat wiring** — many older NB homes only have 2-wire thermostat connections, but smart thermostats often need a C-wire (common wire) for power. Run 18-5 thermostat wire to future-proof your HVAC controls.

Whole-home audio pre-wiring using 14-2 or 16-2 speaker wire to ceiling or wall locations in main living areas creates options for built-in sound systems. This is especially valuable in open-concept renovations popular in New Brunswick homes.

Specialized Considerations

Doorbell wiring should be upgraded to handle video doorbells — run 18-2 wire from your electrical panel area to the front door location. Traditional doorbell transformers often can't power modern video doorbells reliably.

For **home offices** (increasingly important post-COVID), consider dedicated ethernet, coax, and even fiber-optic conduit runs. Many New Brunswick professionals now work remotely and need reliable, fast internet connections.

Installation Tips

Run all low-voltage wiring in separate conduits or at least 12 inches away from electrical wiring to prevent interference. Use a central distribution panel in a basement or utility room as your hub — this makes future upgrades much easier. Label everything clearly with wire tags.

TSANB Requirements

Low-voltage wiring under 30 volts typically doesn't require electrical permits in New Brunswick, but always verify with TSANB for your specific installation. However, any 120V outlets needed to power equipment (like network switches or security panels) will need proper electrical work by a licensed electrician.

The key is planning now while walls are open — adding these systems later means fishing wires through finished walls, which is expensive and sometimes impossible. Consider your family's current needs plus what you might want in 5-10 years.

Need help finding an electrician who can coordinate the electrical and low-voltage work? New Brunswick Electrical can match you with local professionals experienced in renovation wiring projects.

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Q3

What size wire do I need for a 240-volt circuit to my workshop in New Brunswick?

Wire size for a 240V workshop circuit depends on the amperage of your equipment — the Canadian Electrical Code requires specific wire gauges to safely carry the load without overheating.

Common 240V workshop circuits and wire sizes:

| Equipment | Typical Amps | Breaker Size | Wire Size (Copper) | Wire Size (Aluminum) | |----------|----------|----------|----------|----------| | Welder (small) | 30A | 30A 2-pole | #10 AWG | #8 AWG | | Table saw | 20-30A | 30A 2-pole | #10 AWG | #8 AWG | | Air compressor | 20-30A | 30A 2-pole | #10 AWG | #8 AWG | | Welder (large) | 40-50A | 50A 2-pole | #6 AWG | #4 AWG | | Sub-panel feed | 60A | 60A 2-pole | #6 AWG | #4 AWG | | Sub-

panel feed | 100A | 100A 2-pole | #3 AWG | #1 AWG |

Important CEC rules:

- These sizes are for **copper wire** at standard temperatures with runs under 50 feet. Longer runs may require upsizing one gauge to prevent voltage drop
- **Aluminum wire** requires one size larger than copper for the same amperage
- All 240V circuits require a **2-pole breaker** — the wire needs two hot conductors, one neutral (sometimes), and one ground
- **Wire in conduit** may need to be derated if running alongside multiple other circuits due to heat buildup

  Voltage drop matters for long runs:

  If your workshop is in a detached garage or barn far from the house panel, voltage drop becomes a real issue:

- **Under 50 feet**: Standard wire sizes above are fine
- **50-100 feet**: Consider upsizing one gauge (e.g., #6 instead of #8 for 40A)
- **Over 100 feet**: Definitely upsize — or install a sub-panel in the workshop fed by a larger feeder cable

  Voltage drop causes motors to run hot, start slowly, and potentially burn out. A licensed electrician will calculate the exact voltage drop for your specific distance.

  For a detached workshop in NB:

  Running wire to a separate building requires:

- Underground burial in conduit at minimum 24-inch depth (CEC requirement)
- Separate grounding electrode (ground rod) at the workshop
- Neutral and ground separated in the sub-panel (not bonded like in the main panel)
- Weatherproof entrance fitting where the wire enters the building

  NB-specific considerations:

- Rocky soil common across NB makes trenching difficult — budget extra for excavation
- Frost depth of 48-60 inches in northern NB means underground conduit should include expansion fittings
- TSANB permit required for all new circuits — your electrician will handle this

  Cost in New Brunswick:

- Single 240V circuit (under 50 feet): $500-$1,000
- 100A sub-panel to detached workshop: $3,000-$5,000 including trenching
- TSANB permit: $100-$200

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Q4

What gauge wire do I need for different electrical circuits in my New Brunswick home?

Using the correct wire gauge for each circuit in your home is fundamental to electrical safety — undersized wire overheats, creating a fire hazard, while oversized wire wastes money unnecessarily. The Canadian Electrical Code (CEC) specifies minimum wire sizes based on circuit amperage, and TSANB inspectors verify compliance during inspections.

Wire Gauge Basics

Electrical wire in Canadian homes is measured in **AWG (American Wire Gauge)**. The numbering is counterintuitive: **smaller numbers mean thicker wire**. Thicker wire carries more current safely because it has lower resistance and generates less heat.

Residential wiring in New Brunswick uses **NMD90 cable** (non-metallic dry, rated for 90°C) — commonly known by the brand name "Romex" (though Romex is technically a US brand; Canadian equivalents are made by Southwire, Nexans, and others). NMD90 cable contains two or three insulated conductors plus a bare ground wire, all inside a plastic sheath.

Wire Gauge by Circuit Type

Circuit Type	Breaker Size	Wire Gauge	Cable Type	Common Use
General lighting	15 amp	**14 AWG**	14/2 NMD90	Bedroom, hallway, closet lights
General outlets	15 amp	**14 AWG**	14/2 NMD90	Bedroom, living room outlets
Kitchen countertop	20 amp	**12 AWG**	12/2 NMD90	Small appliance circuits (CEC minimum 2 per kitchen)
Bathroom outlet	20 amp	**12 AWG**	12/2 NMD90	Bathroom GFCI receptacle
Laundry outlet	20 amp	**12 AWG**	12/2 NMD90	Washing machine outlet
Garage/workshop outlet	20 amp	**12 AWG**	12/2 NMD90	Power tool circuits
Outdoor outlet	20 amp	**12 AWG**	12/2 NMD90	GFCI-protected exterior receptacles
Dishwasher	15 or 20 amp	**14 or 12 AWG**	14/2 or 12/2	Dedicated dishwasher circuit
Microwave (built-in)	20 amp	**12 AWG**	12/2 NMD90	Dedicated microwave circuit
Refrigerator	15 amp	**14 AWG**	14/2 NMD90	Dedicated fridge circuit
Electric range/oven	40 amp	**8 AWG**	8/3 NMD90	240V range circuit
Electric dryer	30 amp	**10 AWG**	10/3 NMD90	240V dryer circuit
Electric water heater	30 amp	**10 AWG**	10/2 NMD90	240V water heater
Baseboard heater (1500W)	15 amp	**14 AWG**	14/2 NMD90	240V baseboard heat
Baseboard heater (2000W)	20 amp	**12 AWG**	12/2 NMD90	240V baseboard heat
Central AC / Heat pump	20–40 amp	**10–8 AWG**	Varies	Dedicated 240V circuit
EV charger (Level 2)	40 amp	**8 AWG**	8/2 NMD90	Dedicated 240V, 40A circuit
EV charger (high power)	50 amp	**6 AWG**	6/2 NMD90	Dedicated 240V, 50A circuit
Hot tub	40–50 amp	**8–6 AWG**	8/2 or 6/2	Dedicated

240V with GFCI | | Sub-panel feeder (60A) | 60 amp | **6 AWG** | 6/3 NMD90 | Garage or workshop sub-panel | | Sub-panel feeder (100A) | 100 amp | **3 AWG** | 3/3 NMD90 | Large workshop or secondary suite |

Key CEC Rules for Wire Sizing

Never upsize a breaker without upsizing the wire. A 15-amp breaker protects 14-gauge wire. If you swap in a 20-amp breaker without replacing the wire with 12-gauge, the breaker won't trip until the wire is already dangerously overheated. This is one of the most dangerous code violations found in NB homes.

You CAN use heavier wire on a smaller breaker. Running 12-gauge wire on a 15-amp circuit is perfectly acceptable (and some electricians prefer it for future flexibility). You just can't do the reverse.

Continuous loads at 125%. The CEC requires that circuits serving continuous loads (loads that run for 3+ hours — like baseboard heaters, EV chargers, and some lighting) be rated at **125% of the load**. Example: a 1,920W baseboard heater on 240V draws 8 amps, but 8 × 1.25 = 10 amps, so a 15-amp circuit with 14-gauge wire is technically adequate. However, for 2,000W heaters (8.33A × 1.25 = 10.4A), a 15-amp circuit is still sufficient but leaves less margin.

Voltage drop on long runs. For wire runs exceeding **15 metres (50 feet)**, voltage drop becomes a concern. The CEC recommends no more than **5% total voltage drop** from the panel to the outlet. For long runs (basement to detached garage, for example), upsizing the wire by one gauge compensates. Example: a 40-foot run that would normally use 14-gauge should use 12-gauge if it extends to 80+ feet.

NB-Specific Considerations

Baseboard heating circuits: New Brunswick's heavy reliance on electric baseboard heat means many homes have **5–10 heating circuits**. Each baseboard heater gets either a dedicated circuit or shares with one adjacent heater. The CEC treats heating as a continuous load (125% rule applies), so wire sizing is critical.

Common NB baseboard wiring:

- 750W heater: 3.13A at 240V ? 14 AWG on 15A breaker (adequate)
- 1,000W heater: 4.17A at 240V ? 14 AWG on 15A breaker (adequate)
- 1,500W heater: 6.25A at 240V ? 14 AWG on 15A breaker (adequate)
- 2,000W heater: 8.33A at 240V ? 12 AWG on 20A breaker (recommended)
- Two 1,500W heaters on one circuit: 12.5A at 240V ? 12 AWG on 20A breaker (required)

  Well pump circuits: Many rural NB homes use well pumps. A standard 1/2 HP submersible well pump needs a **dedicated 15-amp circuit with 14-gauge wire**. A 1 HP pump needs a **20-amp circuit with 12-gauge wire**. Because well pumps are motor loads with high starting current, the circuit must handle **startup surge of 2–3**

times running amps — the breaker accommodates this with its trip delay, but the wire must still be properly sized for the continuous running load.

Underground runs: Wire running underground to a detached garage, shed, or outbuilding must be either:

- **NMWU cable** (rated for wet/underground use) direct-buried at CEC-specified depth, OR
- **Standard NMD90 pulled through PVC conduit** buried at specified depth

The wire gauge must account for voltage drop over the underground distance.

Wire Costs in New Brunswick (2026 Approximate)

| Wire | Per Metre | Per 75m Roll | |------|----------|-------------| | 14/2 NMD90 | $1.00–$1.50 | $75–$110 | | 12/2 NMD90 | $1.50–$2.00 | $110–$150 | | 10/2 NMD90 | $2.50–$3.50 | $190–$260 | | 10/3 NMD90 | $3.50–$5.00 | $260–$375 | | 8/3 NMD90 | $5.00–$7.00 | $375–$525 | | 6/3 NMD90 | $7.00–$10.00 | $525–$750 |

Prices at Kent Building Supplies, Home Hardware, and electrical supply houses in Moncton, Fredericton, and Saint John. Prices fluctuate with copper market conditions.

Common Mistakes Found in NB Homes

- **14-gauge wire on 20-amp breakers:** Found in older homes where a homeowner upgraded the breaker without upgrading the wire. Extremely dangerous.
- **Extension cord as permanent wiring:** Running a cord through a wall or ceiling to permanently supply power. Violates CEC and is a fire hazard.
- **Mixed gauge on one circuit:** Starting with 12-gauge from the panel but splicing to 14-gauge partway through. The 20-amp breaker won't protect the 14-gauge section.
- **Wrong cable type underground:** Using standard NMD90 buried directly in soil (it's not rated for direct burial — the sheath degrades).

All new wiring and circuit modifications in New Brunswick require a **TSANB permit and inspection** to verify proper wire gauge, connections, and code compliance.

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Q5

What are the signs my home's electrical wiring needs to be replaced in New Brunswick?

Knowing when your home's wiring has reached the end of its safe service life can prevent electrical fires, protect your family, and save money on emergency repairs. Many New Brunswick homes — particularly those built between the 1940s and 1980s in Saint John, Fredericton, Moncton, and surrounding communities — have wiring that's approaching or past its expected lifespan.

Warning Signs You Shouldn't Ignore

Frequent Breaker Trips or Blown Fuses

Occasional breaker trips are normal — it means your overcurrent protection is working. But **frequent trips on the same circuit** (more than once or twice per month under normal use) indicate:

- Circuit overloading (too many devices for the wire gauge)
- Loose connections generating heat
- Deteriorating wire insulation causing short circuits
- Failing breaker (though this points to a panel issue, not wiring)

  If you're constantly resetting the same breaker, don't just upsize it to a larger amp rating — that defeats the overcurrent protection and can overheat the wires. Call a licensed electrician to diagnose the root cause.

Burning Smell or Discolouration at Outlets

This is an emergency sign. A burning or acrid smell near outlets, switches, or your panel means something is overheating — usually a loose connection arcing inside the box or deteriorated insulation allowing wires to contact each other.

Look for:

- Brown or yellow discolouration on outlet cover plates

- Melted plastic on receptacles or switches
- Black scorch marks around outlet slots
- Warmth when you touch a cover plate (outlets and switches should be room temperature)

If you notice any of these, **turn off the circuit at the panel immediately** and call an electrician. Don't use the outlet or switch until it's been inspected.

Flickering or Dimming Lights

While occasional flickering can be caused by external factors (NB Power supply fluctuations, wind on service connections), persistent flickering that occurs regardless of weather suggests:

- Loose connections at the fixture, switch, or splice
- Deteriorating wire insulation making intermittent contact
- Overloaded circuit (lights dim when another appliance kicks on)
- Neutral connection problems (potentially dangerous — can cause overvoltage on some circuits)

Tingling or Mild Shock When Touching Appliances

If you feel a tingle or slight shock when touching a metal appliance, light switch, or outlet cover plate, you have a **grounding problem**. This means stray current is finding a path through the appliance chassis instead of safely returning through the ground wire. This is more than uncomfortable — it can be lethal under the right conditions.

Common in older NB homes with:

- Two-prong (ungrounded) outlets
- Deteriorated ground connections
- Knob-and-tube wiring (which has no ground wire at all)

Two-Prong Outlets Throughout the Home

Two-prong outlets mean your wiring predates modern grounding requirements. While the outlets themselves can be replaced, the real issue is the **lack of a ground conductor** in the cable. Options:

- Full rewire with modern NMD90 cable (copper, grounded)
- Adding GFCI protection to ungrounded circuits (provides shock protection but not equipment grounding)
- Running dedicated ground wires to outlet boxes (sometimes feasible, sometimes not)

Types of Problem Wiring in NB Homes

Knob-and-Tube (Pre-1940s)

Status: Should be replaced. Knob-and-tube wiring was installed in homes built before the 1940s — found in older areas of Saint John (particularly the South End and West Side), Fredericton's historic Waterloo Row area, and Woodstock's downtown residential streets.

Problems:

- No ground wire — zero equipment grounding
- Insulation is rubber-coated cloth that becomes brittle and crumbles after 70+ years
- Not designed for modern electrical loads (was engineered for lights and a radio, not kitchen appliances and air conditioning)
- Cannot be covered with blown-in insulation — the wires need air circulation to dissipate heat, and insulation traps heat, creating fire risk
- Many insurance companies in New Brunswick **will not insure** homes with active knob-and-tube wiring, or charge substantial surcharges

  Replacement cost: **$8,000–$15,000** for a typical 1,200 sq ft home, depending on accessibility.

Aluminum Branch Wiring (1965–1976)

Aluminum wiring was used extensively in Canadian homes during a period when copper prices were high. Many homes in Moncton's Riverview area, Fredericton's subdivisions (Skyline Acres, Southwood Park), and similar-era developments across NB have aluminum wiring.

The problem isn't the aluminum wire itself — it's the connections. Aluminum:

- Expands and contracts more than copper with temperature changes
- Oxidizes (forms a resistive coating) at connection points
- Is softer than copper and can be damaged by over-tightening
- Was originally connected with devices rated only for copper (CU), not aluminum

  These factors cause connections to loosen, overheat, and arc over time. The CPSC estimated that homes with aluminum wiring are **55 times more likely** to have fire-hazard conditions at outlets.

Remediation options (not always full replacement):

- **COPALUM crimp connectors:** The gold standard. A licensed electrician attaches a short copper "pigtail" to each aluminum wire using a specialized crimp tool. Every outlet, switch, and fixture connection gets pigtailed. Cost: **$50–$80 per connection point**, or **$3,000–$6,000** for a whole house.

- **AlumiConn connectors:** An approved alternative to COPALUM that uses set-screw lugs. Slightly less expensive per point.
- **Full rewire:** Replacing all aluminum branch circuits with copper. More expensive (**$10,000–$20,000**) but eliminates the issue permanently. Often done during major renovations when walls are already open.

Deteriorated NMD Cable (1970s–1980s)

Even copper NMD (non-metallic dry) cable from this era can develop problems:

- Insulation becomes brittle, especially where exposed to heat (near pot lights, in attics)
- Older cable used thinner insulation that's more susceptible to physical damage
- Staples may have been driven too tightly, nicking insulation
- Rodent damage to cable in attics and crawlspaces (common in rural NB properties)

When a Full Rewire Is Necessary vs. Targeted Repairs

Full rewire recommended when:

- Active knob-and-tube wiring throughout the home
- Pervasive aluminum wiring with signs of overheating (or insurance requires it)
- Panel capacity is inadequate (60-amp or 100-amp fuse panel) AND wiring is deteriorated
- Multiple circuits show signs of failure (repeated tripping, scorch marks, failing insulation)
- Major renovation opening walls anyway (rewiring during renovation adds only 30–50% to standalone rewiring cost)

Targeted repairs sufficient when:

- Specific circuits with identified problems (one bathroom, one kitchen circuit)
- Aluminum wiring in good condition — pigtailing all connections is adequate
- Adding circuits for new loads (EV charger, workshop) while existing wiring is functional

Costs in New Brunswick

| Scope | Cost Range | |-------|------------| | Single circuit replacement | $500–$1,500 | | Kitchen rewire (2–3 circuits) | $1,500–$3,000 | | Aluminum pigtailing (whole house) | $3,000–$6,000 | | Full rewire, 1,200 sq ft bungalow | $8,000–$15,000 | | Full rewire, 2,000 sq ft two-storey | $12,000–$22,000 | | Panel upgrade (included if needed) | $2,500–$4,500 | | TSANB permit | $75–$200 |

All rewiring work requires a **TSANB electrical permit and inspection**. Your electrician handles the permit application as part of the project.

Insurance Implications

New Brunswick insurance providers pay close attention to electrical wiring:

- **Knob-and-tube:** Many insurers won't cover it; others charge 25–50% premium surcharge
- **Aluminum wiring:** Most insurers cover it if properly remediated (pigtailed) with documentation
- **60-amp fuse panels:** Increasingly difficult to insure; replacement often required
- **After rewiring:** Provide your insurer with the TSANB inspection certificate — this often results in an immediate premium reduction

If you're buying an older home in New Brunswick, have the electrical system inspected by a licensed electrician (separate from the home inspector) before closing. The $200–$400 inspection fee can save you from inheriting a $15,000+ rewiring project.

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Q6

What are the electrical requirements for a home workshop or woodworking shop in New Brunswick?

Setting up a home workshop with proper electrical infrastructure is one of the most common projects electricians handle in New Brunswick — whether it's a dedicated room in the basement, a section of the garage, or a purpose-built outbuilding. Getting the electrical right from the start prevents nuisance breaker trips, protects your expensive

tools, and keeps you safe.

Assessing Your Power Needs

The first step is listing your equipment and their electrical requirements:

Typical 120V tools (15-20 amp circuits):

- Benchtop drill press: 5–8 amps
- Router: 10–15 amps
- Jigsaw/circular saw: 12–15 amps
- Sanders (belt, orbital): 5–10 amps
- Shop vacuum: 10–12 amps
- Bench grinder: 5–8 amps
- Dust collector (small): 10–15 amps

Typical 240V tools (dedicated circuits required):

- Table saw (contractor grade): 15–20 amps at 240V
- Cabinet table saw: 20–30 amps at 240V
- Jointer (6-inch+): 15 amps at 240V
- Planer (12-inch+): 15–20 amps at 240V
- Dust collector (2HP+): 15 amps at 240V
- Air compressor (5HP+): 20–30 amps at 240V
- Welder (MIG/TIG): 30–50 amps at 240V

Circuit Layout Recommendations

A well-designed workshop electrical layout includes:

Minimum setup (basic hobbyist):

- 2 dedicated 20-amp, 120V circuits for general outlets
- 1 dedicated 20-amp, 120V circuit for lighting
- 1 dedicated 240V circuit for your largest tool (table saw)
- Total panel capacity needed: **60 amps** (sub-panel)

Recommended setup (serious woodworker):

- 4 dedicated 20-amp, 120V circuits for outlets (split between bench areas and machine areas)

- 1 dedicated 20-amp, 120V circuit for lighting
- 2–3 dedicated 240V circuits for major tools
- 1 dedicated circuit for dust collection
- Total panel capacity needed: **100 amps** (sub-panel)

Full workshop (semi-professional):

- 6+ dedicated 20-amp, 120V circuits
- 1–2 dedicated lighting circuits
- 3–4 dedicated 240V circuits
- Dedicated dust collection circuit
- Dedicated air compressor circuit
- Total panel capacity needed: **100–200 amps** (sub-panel)

Outlet Placement and Types

Workshop outlet placement is different from residential — plan for how you'll actually use the space:

Perimeter outlets: Install duplex receptacles every **1.2 metres (4 feet)** along bench walls — far more frequently than standard residential spacing. This prevents the dangerous practice of running extension cords across walkways to reach tools.

Ceiling drops: For tools in the centre of the shop (table saw, assembly table), install **retractable cord reels** or ceiling-mounted outlet boxes. This keeps cords off the floor where they create trip hazards and get buried in sawdust.

240V outlets: Install these within **1.5 metres** of where each major tool will be positioned. Use the correct receptacle type:

- **NEMA 6-20** for 20-amp, 240V (most 240V power tools)
- **NEMA 6-30** for 30-amp, 240V (larger tools, welders)
- **NEMA 6-50** for 50-amp, 240V (large welders, industrial equipment)

Floor outlets: If your workshop has a concrete floor and tools in the centre, consider **floor-mounted outlet boxes** with weatherproof covers (to keep sawdust out). These need to be planned before concrete is poured in new construction.

Lighting Requirements

Workshop lighting is critical for both safety and quality of work:

- **Minimum 500 lux** at workbench surfaces (CEC and good practice)
- **LED shop lights** are the modern standard — 4-foot or 8-foot LED tube fixtures provide even, shadow-free light
- Plan for **50 watts of LED per 100 square feet** of shop space as a starting point
- Install lights on a **separate circuit** from tool outlets — when a tool trips a breaker, you don't want to be plunged into darkness while operating a spinning blade
- A typical 20×20 foot workshop needs **6–8 four-foot LED fixtures** for adequate general lighting
- Add **task lighting** at the table saw, bandsaw, and lathe positions

Cost for LED shop lighting: **$200–$600** for fixtures, plus **$200–$400** for installation on a dedicated circuit.

Sub-Panel Installation

For any workshop beyond the most basic setup, a **dedicated sub-panel** is the right approach:

In-house workshop (basement or attached garage):

- Install a 60–100 amp sub-panel fed from your main panel
- Distance from main panel is usually short, keeping wire costs down
- Cost: **$800–$2,000** for the sub-panel, feeder cable, and installation

Detached workshop/garage:

- Same sub-panel requirements, but add underground or overhead feeder costs
- Underground trench: **$15–$30 per linear foot** (hand dig) or **$8–$15 per foot** (excavator)
- Feeder cable for 100-amp service: **$5–$10 per foot** for copper, less for aluminum
- A 50-foot underground run with 100-amp sub-panel: **$2,500–$5,000** total

TSANB Permit Requirements

All workshop electrical work in New Brunswick requires a **TSANB (Technical Safety Authority of New Brunswick) permit and inspection**:

- New circuits from existing panel: permit required
- Sub-panel installation: permit required
- Underground feed to detached building: permit required
- Permit fee: **$75–$200** depending on scope

Your electrician handles the permit application, but make sure it's included in their quote. Some contractors in more rural areas of New Brunswick (Woodstock, Grand Falls, Edmundston) may be tempted to skip permits for "just a garage" — don't agree to this. Unpermitted work voids insurance coverage and creates problems if you sell the home.

Total Cost Estimates

| Workshop Level | In-House | Detached Building | |---|---|---| | Basic (2 circuits + 1 240V) | $800–$1,500 | $2,500–$4,000 | | Recommended (sub-panel + 4–6 circuits) | $1,500–$3,000 | $3,500–$6,000 | | Full workshop (100A sub-panel + 8+ circuits) | $2,500–$5,000 | $5,000–$10,000 |

These include labour, materials, permit, and inspection. Add **$200–$600** for LED lighting.

New Brunswick-Specific Considerations

Heating the workshop: If you plan to heat your workshop with electric heaters, factor this into your panel sizing. A 20×20 foot insulated workshop in Fredericton or Miramichi needs approximately **4,000–6,000 watts** of electric heat to stay comfortable in winter, which adds 25–35 amps to your load calculation.

Moisture control: Basement workshops in New Brunswick are prone to dampness, especially in spring when snow melt raises the water table. All outlets in below-grade workshops should ideally be installed at least **300mm (12 inches) above floor level**, and a dehumidifier on a dedicated circuit is strongly recommended.

Dust collection: Dedicated dust collection is important for any enclosed workshop. A central dust collector (2–3 HP) needs its own 240V circuit and should be on a separate breaker so it can run independently of your tools. Good dust collection also reduces the fire risk from airborne wood dust — a genuine safety concern in enclosed spaces.

Insurance notification: If you're setting up a workshop in your home or on your property, notify your home insurance provider. Some policies exclude or limit coverage for home-based workshop activities, particularly if you sell products or use industrial equipment. Getting proper electrical permits and inspections helps support your insurance coverage.

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Q7

What electrical work is needed to finish a basement in New Brunswick?

Electrical Requirements for Finishing a Basement in New Brunswick

Finishing a basement is one of the most popular home improvement projects in NB — it adds livable space at a fraction of the cost of an addition. The electrical scope depends on whether you're creating basic living space or a full basement apartment.

Basic Finished Basement (Recreation Room / Family Room)

Minimum electrical requirements (CEC):

- **Receptacles:** No point along a wall can be more than 1.8 metres from an outlet. For a typical 600 sq ft basement, this means 8–14 receptacles depending on layout.
- **Lighting:** At least one switched light fixture in every room and hallway. Most homeowners want recessed pot lights — plan for 1 light per 20–25 sq ft of open space.
- **Smoke detector:** Hardwired, interconnected with the rest of the home's detectors. At least one on the basement level.
- **CO detector:** Required if the basement has or is near a fuel-burning appliance (furnace, water heater, fireplace).
- **AFCI protection:** All 15A and 20A circuits serving receptacles in bedrooms, living areas, recreation rooms, and hallways must have AFCI breakers.
- **GFCI protection:** Any receptacles in unfinished portions of the basement (utility room, storage areas) require GFCI.

  Typical circuit layout for a basic finished basement:

  | Circuit | Type | Purpose | |---------|------|---------| | 1 | 15A general | Receptacles — recreation room | | 2 | 15A general | Receptacles — bedroom (if applicable) | | 3 | 15A lighting | All basement lights + switches | | 4 | 20A dedicated | Bathroom receptacles (if bathroom included) | | 5 | 15A/20A | Utility/storage area receptacles | | 6+ | 240V (if needed) | Electric baseboard heaters |

Heating Circuits

Basements in NB need heating — our winters demand it. Common options and their electrical requirements:

Electric baseboard heaters (most common for NB basements):

- Each heater (or group of heaters) on a dedicated 240V circuit
- A 600 sq ft basement typically needs 4,000–6,000 watts of baseboard capacity
- That's 2–3 dedicated 240V circuits with individual thermostats
- Cost: $400–$1,000 for heaters + $600–$1,500 for wiring

Mini-split heat pump (more efficient):

- One dedicated 240V, 20–30A circuit
- Heats AND cools the basement
- More expensive upfront ($3,500–$6,000 installed) but 60–70% cheaper to operate than baseboard
- Best choice if the basement will be heavily used

Extension of existing forced-air system:

- Minimal new electrical (just the duct work and possibly a duct booster fan)
- May not adequately heat the basement if the existing furnace is undersized

Bathroom Electrical (If Adding a Bathroom)

A basement bathroom adds significant electrical scope:

- 20A dedicated receptacle circuit with GFCI protection
- Exhaust fan on the bathroom circuit or separate circuit
- Lighting on a separate or shared circuit
- In-floor heating (optional but popular): dedicated 240V circuit, $800–$1,800
- Venting the exhaust fan to the exterior is critical — in NB basements, moisture problems are already a concern. Never vent into the joist space.

Panel Capacity

A basic basement finish adds 4–8 new circuits to your panel. Check your panel's available space:

- **200A panel with 40 spaces:** Usually has room for 6–10 additional circuits
- **200A panel with 20 spaces:** May need tandem breakers or a sub-panel
- **100A panel:** Likely needs an upgrade to 200A before adding basement circuits, especially if adding electric heat. Cost: $2,500–$4,500

Rough-In Timing (Critical)

Electrical rough-in must be completed and inspected BEFORE insulation and drywall:

- **Framing complete** — walls framed, ceiling structure in place
- **Plumbing rough-in** (if bathroom)
- **HVAC rough-in** (ductwork, mini-split line set)
- **Electrical rough-in** — all boxes mounted, wiring run, circuits connected at panel
- **TSANB rough-in inspection** — inspector verifies wiring before it's hidden
- **Insulation** — spray foam or batt insulation in exterior walls
- **Vapour barrier** (6-mil poly on warm side of insulation)
- **Drywall**
- **Electrical trim** — install outlets, switches, lights, cover plates
- **TSANB final inspection**

  Do NOT skip or delay the rough-in inspection. If drywall is up when the inspector arrives, they may require you to remove it for visual verification — a costly and frustrating mistake that happens frequently in NB basement projects.

NB-Specific Basement Considerations

Moisture: NB basements are prone to dampness, especially in spring during snowmelt and in areas with high water tables (river communities, low-lying areas in Moncton and Fredericton). Ensure:

- All outlets in potentially damp areas have GFCI protection
- Wiring is run above the potential flood level where possible
- A sump pump is on its own dedicated circuit (not shared with anything else), and ideally connected to a battery backup sump pump system

  Insulation type matters for wiring: Spray foam insulation (common in NB basement renovations for its moisture resistance) is applied AFTER electrical rough-in. The electrician needs clear access to run wires through studs before the foam goes in. Once sprayed, rerouting wires is extremely difficult.

  Ceiling height: Many NB basements have 7–7.5 foot ceilings. Recessed pot lights preserve headroom better than flush-mount fixtures. Slim LED panels (less than 1 inch thick) are another good option for low ceilings.

Costs for Basement Electrical in NB

| Scope | Cost Range | |-------|------------| | Basic rec room (6 circuits, lights, outlets, smoke detector) | $3,000–$6,000 | | Rec room + bedroom + bathroom | $5,000–$10,000 | | Full basement apartment (see

basement apartment guide) | $8,000–$20,000 | | Electric baseboard heating (3 circuits + thermostats) | $1,000–$2,500 | | Mini-split heat pump (electrical portion only) | $400–$1,200 | | Panel upgrade (if needed) | $2,500–$4,500 | | TSANB permit (rough-in + final inspection) | $75–$150 |

Getting Started

Before any construction, have a TSANB-licensed electrician visit to assess your panel, plan the circuit layout, and discuss your vision for the space. A 30-minute consultation ($0–$100, often free with a commitment to hire) prevents expensive changes mid-project. Provide your floor plan with room locations, bathroom placement, and any special requirements (home theatre, workshop, wet bar) so the electrician can plan adequate circuits from the start.

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Q8

What is aluminum wiring and is it safe in my New Brunswick home?

Aluminum Wiring in New Brunswick Homes: Safety and Solutions

Aluminum branch circuit wiring was installed in Canadian homes from approximately 1965 to 1976, when copper prices spiked and aluminum became the affordable alternative. Many New Brunswick homes from this era — particularly in suburban developments in Moncton, Fredericton, Saint John, and Riverview — have aluminum wiring.

Is Aluminum Wiring Dangerous?

Aluminum wiring itself conducts electricity safely. The danger is at the **connection points** — where aluminum wire meets outlets, switches, light fixtures, and panel terminals. The problems:

1. Oxidation Aluminum oxidizes when exposed to air, forming aluminum oxide on the wire surface. Unlike copper oxide (which still conducts), aluminum oxide is an insulator. This creates resistance at connections, which generates heat.

2. Thermal expansion Aluminum expands and contracts with temperature changes about 30% more than copper. Every time the wire heats (under load) and cools (load off), the connection loosens slightly. Over years, this creates progressively looser connections.

3. Galvanic corrosion When aluminum contacts copper or brass (the material in most outlets and switches), galvanic corrosion occurs in the presence of moisture. This further degrades the connection.

4. Creep Aluminum under sustained pressure (like a screw terminal) slowly deforms — a property called creep. This loosens connections over time even without thermal cycling.

The combined result: Over decades, aluminum connections develop high resistance, generate heat, and can ignite surrounding materials. Homes with aluminum wiring are statistically **55 times more likely** to have connections reach fire-hazard conditions than homes with copper wiring (CPSC data).

How to Identify Aluminum Wiring

Look at the wiring in your panel, at outlets (turn off breaker first and pull an outlet from the box), or in the attic:

- **Aluminum wire is silver-coloured** (copper is orange/brown)
- **Cable markings** may include "AL" or "ALUMINUM" printed on the jacket
- **Common cable types:** NMDA or NMDS (aluminum versions of NMD copper cable)

  If your NB home was built between 1965 and 1976, there's a reasonable chance it has aluminum wiring on some or all branch circuits.

Insurance Impact in NB

Aluminum wiring creates insurance complications similar to knob-and-tube:

- Some insurers **refuse to insure** homes with unmitigated aluminum wiring
- Others require **an electrical inspection** and proof of remediation (pigtailing or rewiring)
- Premiums may be **20–50% higher** until remediation is documented
- When selling, buyers' insurance requirements often force the seller to address aluminum wiring before closing

Remediation Options

Option 1: Copalum crimping (gold standard) A specially trained electrician uses the Copalum crimp tool to permanently join a short copper pigtail to each aluminum wire end. The copper pigtail then connects to the outlet, switch, or fixture. This method is endorsed by the CPSC and considered a permanent repair.

- Cost: $30–$50 per connection point
- Whole house (100+ connections): $3,000–$5,000
- Limitation: Copalum-certified electricians are rare in NB. You may need to find one specifically.

Option 2: AlumiConn connectors (widely available alternative) AlumiConn is a set-screw connector specifically approved for aluminum-to-copper connections. It uses a mechanical lug with anti-oxidant compound pre-applied. These are widely available and any licensed electrician can install them.

- Cost: $3–$5 per connector, $20–$40 per connection point including labour
- Whole house: $2,000–$4,000
- Approved by major electrical authorities as an acceptable repair method

Option 3: Complete rewire Replace all aluminum branch wiring with modern copper NMD90 cable.

- Cost: $10,000–$25,000+ depending on home size and accessibility
- Most thorough solution but also most expensive and disruptive
- Makes sense if the home needs other major electrical work (panel upgrade, additional circuits) at the same time

Option 4: CO/ALR devices Replace all outlets and switches with devices rated "CO/ALR" (Copper/Aluminum Revised) — these are specifically designed to accept aluminum wire safely.

- Cost: $5–$10 per device, $100–$200 labour per device
- Whole house: $1,000–$2,000
- Considered acceptable but less thorough than pigtailing. Addresses only the device connection, not junction box splices.

What NOT to Do

- **Do not use standard wire nuts** to connect aluminum to copper — standard wire nuts don't prevent oxidation and can create the same problems
- **Do not use push-in (backstab) connections** on aluminum — the spring clips lose grip as aluminum creeps
- **Do not ignore it** — aluminum connections degrade over time, and the fire risk increases with age

- **Do not attempt DIY remediation** — improper aluminum connections are more dangerous than no repair at all

Recommended Approach for NB Homeowners

- **Have a TSANB-licensed electrician inspect** all accessible aluminum connections ($200–$400 diagnostic)
- **Pigtail with AlumiConn connectors** at every connection point — outlets, switches, fixtures, junction boxes ($2,000–$4,000)
- **Apply anti-oxidant compound** at panel connections
- **Document the remediation** for your insurance company — get a written report from the electrician
- **Budget for full rewiring** as a future project if major renovations are planned

The pigtailing approach is the most cost-effective solution that fully addresses the fire risk. It's a 1–2 day project for a licensed electrician and brings insurance compliance while protecting your family.

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Q9

What size wire do I need for different electrical circuits in my home?

Wire Gauge Guide for Residential Electrical Circuits in New Brunswick

Using the correct wire gauge (thickness) for each circuit is critical for safety. Undersized wire overheats under load, creating a fire hazard. The Canadian Electrical Code specifies minimum wire sizes based on circuit amperage.

Wire Gauge Basics

Wire gauge in Canada uses AWG (American Wire Gauge) numbers. **Lower numbers = thicker wire = more current capacity.** The most common residential wire sizes:

| AWG | Diameter | Typical Use | |-----|----------|-------------| | 14 AWG | 1.63mm | 15-amp circuits | | 12 AWG | 2.05mm | 20-amp circuits | | 10 AWG | 2.59mm | 30-amp circuits | | 8 AWG | 3.26mm | 40-amp circuits | | 6 AWG | 4.11mm | 50-amp circuits | | 4 AWG | 5.19mm | 60-70 amp circuits | | 3 AWG | 5.83mm | Sub-panels, large loads | | 1/0–4/0 AWG | 8.25–11.7mm | Service entrance, 100-200A |

Common Residential Circuits

15-amp circuits (14 AWG NMD90)

- Bedroom outlets and lights
- Living room outlets and lights
- Hallway and closet outlets
- General lighting circuits
- Maximum continuous load: 12 amps (1,440 watts)

  20-amp circuits (12 AWG NMD90)

- Kitchen countertop receptacles (minimum 2 circuits required)
- Bathroom receptacles
- Laundry room receptacles
- Garage receptacles
- Outdoor receptacles
- Dishwasher
- Microwave (if dedicated circuit)
- Maximum continuous load: 16 amps (1,920 watts)

  30-amp circuits (10 AWG NMD90)

- Electric dryer (240V)
- Window/wall AC unit (large)
- Small hot tub (240V)
- Electric water heater (some models)

  40-amp circuits (8 AWG NMD90)

- Electric range/stove (smaller models)

- EV charger (40A)
- Large hot tub

50-amp circuits (6 AWG NMD90)

- Electric range/stove (standard)
- EV charger (50A)
- Large hot tub
- Sub-panel feed (50A)

NMD90 Cable Naming

The cable you buy at Kent or Home Hardware in NB is labelled like this: **14/2 NMD90** or **12/3 NMD90**

- First number (14, 12, 10, etc.) = wire gauge (AWG)
- Second number (2 or 3) = number of insulated conductors (plus a bare ground wire)

  - **/2** = black (hot) + white (neutral) + bare ground — used for standard circuits - **/3** = black (hot) + red (hot) + white (neutral) + bare ground — used for 240V circuits, 3-way switches, or multi-wire branch circuits
- **NMD90** = Non-Metallic Dry, rated for 90°C — the standard residential cable type in Canada

Voltage Drop on Long Runs

This is where many DIYers and even some electricians make mistakes. Over long distances, wire resistance causes voltage drop — the appliance at the end of the run receives less than 120V or 240V.

The CEC limits voltage drop to **5% maximum** from the panel to the furthest outlet (3% on the branch circuit is the recommended design target).

Practical impact in NB: Detached garages, barns, and workshops are often 20–40 metres from the house panel. At these distances, you may need to upsize the wire:

| Circuit | Up to 15m | 15–25m | 25–40m | |---------|-----------|--------|--------| | 15A (120V) | 14 AWG | 12 AWG | 10 AWG | | 20A (120V) | 12 AWG | 10 AWG | 8 AWG | | 30A (240V) | 10 AWG | 10 AWG | 8 AWG | | 50A (240V) | 6 AWG | 6 AWG | 4 AWG |

These are copper wire values. Aluminum wire (common for larger feeds due to cost savings) requires upsizing by 1–2 gauge sizes.

Copper vs. Aluminum

For branch circuits (15A, 20A), **copper is standard** in NB residential work. Aluminum is used for:

- Service entrance cables (100A, 200A feeds)
- Large sub-panel feeds (60A+)
- Long underground runs where copper cost is prohibitive

Aluminum costs about 40–60% less than copper but requires:

- Larger gauge for the same amperage
- Anti-oxidant compound on all connections
- AL/CU-rated devices and connectors
- Proper torque on terminal screws

Never mix aluminum and copper at a connection point without approved AL/CU connectors. This caused house fires in the 1960s–1970s when aluminum branch wiring was connected to copper-only devices.

Cost of Wire in NB (2025–2026)

| Wire | Approximate Cost per Metre | |------|----------| | 14/2 NMD90 (copper) | $1.50–$2.50 | | 12/2 NMD90 (copper) | $2.00–$3.50 | | 10/3 NMD90 (copper) | $4.00–$6.00 | | 6/3 NMD90 (copper) | $8.00–$14.00 | | 4/0 aluminum (service) | $8.00–$12.00 |

Wire prices have been volatile since 2020 due to copper market fluctuations. Get current pricing before budgeting a project.

Key Takeaway

The wire gauge is determined by the breaker size, not the other way around. Never put a larger breaker on existing wire to "stop it from tripping" — this removes the overcurrent protection and can cause the wire to overheat and start a fire. If a breaker trips frequently, the solution is reducing the load or running a new properly sized circuit. A TSANB-licensed electrician in New Brunswick will size everything correctly as part of permitted work.

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Q10

How do I add a 240-volt outlet for a dryer or stove in New Brunswick?

Adding a 240V Outlet for a Dryer or Stove in New Brunswick

If you're moving a laundry room, converting from gas to electric, or finishing a basement suite, you may need a new 240V outlet. This is not a DIY project — it requires a licensed electrician and a TSANB permit.

Understanding 240V Circuits

Your electrical panel supplies both 120V and 240V. Standard outlets use one hot wire plus neutral (120V). A 240V outlet uses two hot wires (each carrying 120V, opposite phase), a neutral, and a ground — delivering 240V to the appliance.

Dryer Circuits

Modern requirement (CEC):

- **Circuit:** Dedicated 30-amp, 240V
- **Wire:** 10/3 NMD90 (10 AWG, 3 conductors + ground)
- **Outlet:** NEMA 14-30R (4-prong) — two hots, one neutral, one ground
- **Breaker:** 2-pole 30A

  Older 3-prong outlets (NEMA 10-30): Many NB homes built before the 2000s have the older 3-prong dryer outlet with no separate ground. These are grandfathered — you don't need to upgrade the existing outlet. But if you're running a NEW circuit, it must use the 4-prong configuration with a separate ground wire.

Stove/Range Circuits

Modern requirement (CEC):

- **Circuit:** Dedicated 40-amp or 50-amp, 240V
- **Wire:** 6/3 NMD90 (6 AWG for 50A) or 8/3 NMD90 (8 AWG for 40A)
- **Outlet:** NEMA 14-50R (4-prong, 50A) — most common for ranges
- **Breaker:** 2-pole 40A or 50A

  Check your range's nameplate — most residential ranges draw 30–50 amps. A 50-amp circuit handles virtually any residential range and gives headroom.

What the Installation Involves

- **Panel assessment** — your electrician verifies you have space for a new 2-pole breaker AND sufficient amperage capacity on the panel. A 200A panel almost always has room. A 100A panel may already be at capacity, requiring a panel upgrade.
- **Wire routing** — the electrician runs NMD90 cable from the panel to the outlet location. Routes typically go through the basement/crawlspace or attic. Wall penetrations, fire stops, and cable protection (nail plates) are installed per CEC.
- **Outlet box installation** — a large metal or plastic box rated for the wire gauge is installed flush with the wall.
- **Breaker and connections** — the new 2-pole breaker is installed in the panel, wires are connected at both ends, and the circuit is tested.
- **TSANB inspection** — the inspector verifies wire gauge, breaker size, outlet type, grounding, and routing.

Costs in New Brunswick

| Scenario | Cost Range | |----------|------------| | 30A dryer circuit (panel in basement, laundry on main floor) | $400–$800 | | 30A dryer circuit (long run, panel far from laundry) | $700–$1,200 | | 50A range circuit (panel in basement, kitchen above) | $500–$1,000 | | 50A range circuit (long run) | $800–$1,500 | | Panel upgrade required (add $2,500–$4,500) | $3,000–$6,000 total | | TSANB permit | $50–$100 |

The biggest cost variable is the distance between the panel and the outlet. Longer runs need more wire (6 AWG copper is ~$5–$8 per metre), more labour for routing, and may require upsizing the wire to compensate for voltage drop on runs over 15 metres.

Basement Suite Considerations

If you're wiring a basement apartment or in-law suite in your NB home, the suite likely needs its own dedicated dryer circuit and stove circuit. Depending on your municipality and whether you're registering the suite:

- Some jurisdictions require a **separate sub-panel** for the suite
- The stove and dryer circuits must be dedicated — not shared with the main home
- Smoke and CO detectors may need to be on their own circuit
- The suite's electrical may need to be independently metered (check with NB Power and your local building department)

3-Prong to 4-Prong Conversion

If you have an old 3-prong dryer outlet (NEMA 10-30) and buy a new dryer that comes with a 4-prong cord:

Option 1: Replace the dryer's cord with a 3-prong cord ($15–$25, most dryer manufacturers sell them). This is legal for existing installations.

Option 2: Have an electrician upgrade the outlet to a 4-prong NEMA 14-30 by running a ground wire from the outlet back to the panel. Cost: $200–$500 depending on access.

The 4-prong configuration is safer because it provides a dedicated equipment ground separate from the neutral. If you're doing any work near the outlet anyway, upgrading is worthwhile.

Key Takeaway

A 240V circuit installation is straightforward work for a licensed electrician but involves heavy-gauge wiring and double the voltage of a standard circuit. Always use a TSANB-licensed electrician and always get the permit. The inspection confirms everything is safe and up to code, and having a closed permit protects your insurance coverage and home value.

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Q11

Is knob-and-tube wiring in my old New Brunswick house dangerous?

Knob-and-Tube Wiring in Older New Brunswick Homes

Knob-and-tube (K&T) wiring was the standard electrical wiring method from the 1880s through the 1940s. Many older homes in New Brunswick — particularly in Saint John's historic uptown, Fredericton's university district,

Moncton's downtown core, and heritage properties across the province — still have some or all original K&T wiring.

Is It Dangerous?

Knob-and-tube wiring **in its original, undamaged condition is not inherently dangerous**. It was well-engineered for its era. However, after 80–140 years, several factors make it a serious concern:

1. Insulation deterioration The rubber insulation on K&T wiring becomes brittle and crumbles with age, exposing bare copper conductors. This creates a direct shock and fire hazard, especially in attics where temperature cycling accelerates deterioration.

2. No ground wire K&T is a two-wire system (hot and neutral) with no equipment ground. This means no protection from GFCI outlets (they need a ground reference to work properly), no protection for modern electronics, and three-prong adapters on two-prong outlets provide zero actual grounding.

3. Insulation contact K&T was designed to dissipate heat into open air — the wires are suspended on ceramic knobs with air space around them. When blown-in insulation (cellulose, fibreglass) covers K&T wiring, heat can't escape. This is the **leading fire risk** with K&T and a CEC violation. Many NB homes had insulation added decades after the wiring was installed, burying K&T in attics and walls.

4. Overloaded circuits K&T circuits were designed for 15 amps serving a few light fixtures. Today's homes draw far more power — space heaters, window AC units, kitchen appliances, and electronics can overload these circuits, causing overheating.

5. Amateur modifications Decades of homeowner modifications — splicing modern Romex onto K&T with electrical tape, tapping into circuits for additional outlets, running extension cords as permanent wiring — create dangerous connections. These improper splices are common in NB's older housing stock.

Insurance Implications

This is often the biggest practical issue for NB homeowners. Many insurance companies in New Brunswick will:

- **Refuse to insure** a home with active K&T wiring
- **Require an electrical inspection** before issuing a policy
- **Charge higher premiums** (sometimes 20–50% more) if K&T is present but deemed safe by an inspector
- **Require a rewire within a set timeframe** as a condition of coverage

  If you're buying an older home, ask your insurance broker about their K&T policy before closing. Some brokers specialize in older NB properties and can find coverage.

What Should You Do?

Option 1: Full rewire ($8,000–$20,000+ depending on home size) The gold standard. All K&T is replaced with modern NMD90 cable, a new 200-amp panel, grounded outlets, and GFCI/AFCI protection where required. A 1,500 sq ft home in NB typically costs $10,000–$15,000 for a complete rewire.

Option 2: Partial rewire ($3,000–$10,000) Replace K&T in the highest-risk areas first: kitchen, bathrooms, attic (where insulation contact is likely), and any circuits showing damage. Leave lower-risk circuits (like a seldom-used bedroom light) for later.

Option 3: Inspection and monitoring ($200–$400) Have a TSANB-licensed electrician inspect all accessible K&T. They'll check insulation condition, look for improper splices, verify no insulation contact, and test circuits. This buys time but doesn't solve the underlying issues.

TSANB Requirements

Rewiring requires a TSANB electrical permit, and the work must be done by a licensed electrician. A TSANB inspector will verify the work before the permit is closed. If you're renovating any room in an older home, the CEC requires bringing the electrical in that room up to current code — this is often the trigger for partial rewiring.

Heritage Properties

If your home is a designated heritage property (common in Saint John, Fredericton, and St. Andrews), rewiring must be done carefully to avoid damaging original plaster, woodwork, and architectural details. Experienced electricians can fish new wires through walls with minimal visible disruption. Budget an extra 20–30% for heritage-sensitive work.

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Q12

What type of wire do I need for a new circuit in my New Brunswick home?

Choosing the Right Wire for New Circuits in Your New Brunswick Home

Selecting the correct wire type and gauge for a new electrical circuit isn't just about passing a TSANB inspection — it's about safety, performance, and longevity. New Brunswick follows the Canadian Electrical Code (CEC), which specifies exactly what wire types are approved for residential use and which gauge is required for each application.

Wire Types Approved for Residential Use in New Brunswick

NMD90 (Non-Metallic Dry 90°C) — This is the standard residential wiring in New Brunswick, commonly known by the brand name "Romex" (though Romex is technically a US product). NMD90 has two or three insulated copper conductors plus a bare ground wire, all wrapped in a plastic sheath. The "90" means the insulation is rated for 90°C, though the CEC limits its use to 60°C-rated ampacities in residential applications.

- **Where to use:** Interior walls, ceilings, floors — any dry indoor location
- **Where NOT to use:** Underground, outdoors, in conduit exposed to moisture, or embedded in concrete
- **Cost:** $0.80-$2.50 per foot depending on gauge

NMWU (Non-Metallic Wet Underground) — The underground-rated version of NMD90. Has a moisture-resistant jacket suitable for direct burial or wet locations.

- **Where to use:** Underground runs to detached garages, outbuildings, landscape lighting; wet locations like crawl spaces
- **Burial depth:** Minimum 24 inches (600mm) for direct burial in New Brunswick
- **Cost:** $1.50-$4.00 per foot depending on gauge

TECK90 Cable — Armoured cable with a corrugated aluminum outer jacket. Used where physical protection is needed.

- **Where to use:** Exposed runs in garages, workshops, basements where cable could be damaged; can be used indoors or outdoors
- **Cost:** $3.00-$8.00 per foot — significantly more expensive but very durable

Individual conductors in conduit (T90 or RW90) — Single insulated wires pulled through EMT (electrical metallic tubing) or PVC conduit.

- **Where to use:** Service entrances, long exposed runs, commercial applications, panel connections

- **When to choose this:** Required when running wire through conduit; gives flexibility to pull exact wire combinations needed

Wire Gauge Selection by Circuit Type

The CEC mandates minimum wire gauges based on the circuit's amperage rating. Using undersized wire is a fire hazard — the wire overheats before the breaker trips.

| Circuit Type | Breaker Size | Minimum Wire Gauge | Common Uses | |---|---|---|---| | General lighting | 15A | 14 AWG NMD90 | Ceiling lights, bedroom outlets, hallway outlets | | General receptacles | 15A | 14 AWG NMD90 | Living room, bedroom, hallway outlets | | Kitchen countertop | 20A | 12 AWG NMD90 | Counter outlets (minimum 2 circuits required) | | Bathroom | 20A | 12 AWG NMD90 | Bathroom outlets (dedicated circuit) | | Laundry | 20A | 12 AWG NMD90 | Washing machine outlet | | Dishwasher | 15A or 20A | 14 or 12 AWG NMD90 | Dedicated circuit | | Garbage disposal | 15A | 14 AWG NMD90 | Dedicated or shared with dishwasher | | Microwave | 20A | 12 AWG NMD90 | Dedicated circuit (if built-in) | | Electric dryer | 30A | 10 AWG NMD90 | 240V dedicated circuit | | Electric range/stove | 40-50A | 8 or 6 AWG NMD90 | 240V dedicated circuit | | Central A/C or heat pump | 20-40A | 12-8 AWG | Depends on unit specs | | EV charger (Level 2) | 40-50A | 8-6 AWG NMD90 | 240V dedicated circuit | | Electric water heater | 30A | 10 AWG NMD90 | 240V dedicated circuit | | Hot tub | 40-60A | 8-6 AWG | 240V GFCI protected | | Workshop sub-panel | 60-100A | 6-3 AWG or 4-1/0 AL | Feeder to detached building |

Voltage Drop Considerations

For long cable runs — common in New Brunswick's larger rural properties — voltage drop becomes a real concern. The CEC allows a maximum **5% voltage drop** from panel to outlet (3% on the branch circuit, 2% on the feeder is the recommended split).

Practical impact: On a 100-foot run at 120V and 15 amps, 14 AWG wire drops about 4.8V (4%) — borderline acceptable. At the same distance and load, 12 AWG drops only 3V (2.5%) — comfortably within limits.

Rule of thumb for New Brunswick homes:

- Runs under 50 feet: Use the standard minimum gauge for the circuit
- Runs 50-75 feet: Consider upsizing one gauge (14?12, 12?10)
- Runs over 75 feet: Upsize one gauge and calculate the actual voltage drop
- Runs to detached buildings (100+ feet): Always calculate and upsize accordingly

Copper vs. Aluminum

Copper is the standard for all branch circuit wiring in New Brunswick residential construction. It's more conductive, easier to terminate, and doesn't have the oxidation issues that plague aluminum.

Aluminum is still used and code-compliant for larger feeders (service entrance cables, sub-panel feeders) where the cost savings are significant. A 100-amp aluminum feeder to a detached garage costs roughly half as much as copper. However, aluminum requires:

- Anti-oxidant compound on all connections
- Connectors rated for aluminum (marked AL-CU or AL)
- Upsizing by roughly 2 gauges compared to copper (e.g., 1/0 aluminum = 3 AWG copper capacity)

Important: The problematic aluminum wiring found in 1960s-1970s New Brunswick homes was **branch circuit** aluminum (14 and 12 AWG) used for outlets and lights. These smaller aluminum wires and their connections caused fires. Modern aluminum feeder cables (4 AWG and larger) with proper terminations are safe and widely used.

Where to Buy in New Brunswick

Electrical wire is available at:

- **Kent Building Supplies** — Good selection of NMD90 in all common gauges. Locations across NB.
- **Home Hardware** — Carries standard residential wire. Good for common gauges.
- **Home Depot** (Moncton, Saint John, Fredericton) — Wide selection, competitive pricing on bulk spools
- **Electrical wholesalers** (Rexel, Nedco, Guillevin) — Better pricing on large quantities, full range of specialty wire. Some sell to homeowners with a permit; others are trade-only.

Pricing guidance (2025, approximate):

- 14/2 NMD90 (75m spool): $70-$90
- 12/2 NMD90 (75m spool): $100-$130
- 10/3 NMD90 (30m): $120-$160
- 8/3 NMD90 (15m): $100-$140
- 6/3 NMD90 (30m): $250-$350

Prices have fluctuated significantly with copper commodity pricing — check current prices before budgeting.

Permit Requirements

Any new circuit installation in New Brunswick requires a TSANB electrical permit ($50-$100). This applies whether you're hiring a licensed electrician or doing permitted homeowner work on your own residence. The

TSANB inspector will verify proper wire type, gauge, protection, routing, and connections before approving the installation.

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Q13

How do I add a 240 volt outlet for my dryer or stove in a New Brunswick home?

Adding a 240-Volt Outlet for a Dryer or Stove in New Brunswick

Adding a 240V outlet for a dryer or electric range is one of the most common electrical jobs in New Brunswick homes — whether you're replacing a gas appliance with electric, finishing a basement laundry, setting up a secondary suite, or moving your laundry to a different room. This is **not a DIY job for most homeowners** because of the high amperage involved, but understanding what's required helps you budget and communicate with your electrician.

Dryer vs. Stove — Different Requirements

Electric dryer (standard residential):

- **Circuit:** 30-amp, 240V dedicated circuit
- **Wire:** 10/3 NMD90 copper (10 AWG, 3 conductors + ground)
- **Outlet:** NEMA 14-30R (4-prong — the modern standard since 1996)
- **Breaker:** 30-amp double-pole breaker

Electric range/stove (standard residential):

- **Circuit:** 40 or 50-amp, 240V dedicated circuit
- **Wire:** 8/3 NMD90 copper (for 40A) or 6/3 NMD90 copper (for 50A)
- **Outlet:** NEMA 14-50R (4-prong)
- **Breaker:** 40 or 50-amp double-pole breaker

Important note on 3-prong vs. 4-prong: Older New Brunswick homes (pre-1996) may have 3-prong 240V outlets (NEMA 10-30 for dryers, NEMA 10-50 for ranges). These do not include a separate ground conductor — the neutral wire doubled as the ground. The CEC now requires 4-prong outlets with separate neutral and ground for all new installations. If you're adding a new outlet, it must be 4-prong. Existing 3-prong outlets can remain if undisturbed, but most electricians recommend upgrading when replacing an appliance.

What the Job Involves

Step 1: Panel assessment

Your electrician first checks whether your panel can accommodate the new circuit:

- **Available breaker space:** A 240V circuit requires a double-pole breaker, taking 2 spaces in the panel. If your panel is full, you may need tandem breakers (if the panel supports them) or a sub-panel.
- **Available capacity:** A 30-amp dryer circuit adds 7,200 watts of potential load. A 50-amp range circuit adds 12,000 watts. Your panel's total capacity must support this without exceeding the service rating. Most 200-amp panels handle this easily. 100-amp panels may be borderline — your electrician will calculate the total load.
- **Panel condition:** While they're in the panel, a good electrician checks for any existing issues — loose connections, corroded bus bars, signs of overheating. In older Moncton, Saint John, and Fredericton homes, the panel assessment sometimes reveals issues worth addressing while the panel cover is off.

Step 2: Cable routing

The heaviest part of the job — literally. 6/3 NMD90 cable for a range circuit is thick, stiff, and heavy. Running it through walls, floors, and ceilings requires skill and patience.

- **Short run (panel to adjacent room, under 25 feet):** Straightforward. Cable runs through floor joists or wall cavities with minimal obstacles.
- **Medium run (different floor or opposite side of house, 25-50 feet):** More complex. May require drilling through multiple joists, fire-stopping penetrations, and careful routing to avoid existing utilities.
- **Long run (to detached building or distant part of house, 50+ feet):** Requires voltage drop calculation. For a 50-amp circuit at 75 feet, 6/3 copper is borderline — your electrician may upsize to 4/3 to stay within the CEC's 5% voltage drop limit. This adds $2-$4 per foot to the cable cost.

Step 3: Outlet installation

The outlet box must be:

- Rated for the wire gauge (most standard boxes are fine)
- Secured to framing
- Accessible (not behind the appliance where you can't reach the plug)
- Mounted at the correct height — typically 300mm (12 inches) from floor for dryers, same for ranges, though some electricians mount range outlets at counter height if the range is a slide-in model

Step 4: Breaker installation and testing

The double-pole breaker is installed in the panel, wired, tested for proper voltage (should read 240V between hot legs, 120V from each hot to neutral), and the circuit is verified for correct grounding and polarity.

Cost Breakdown for New Brunswick

Adding a dryer outlet (30A, 240V):

| Component | Cost | |----------|------| | 10/3 NMD90 cable (25-50 ft) | $60-$150 | | 30A double-pole breaker | $15-$25 | | NEMA 14-30R outlet + box | $15-$25 | | Labour (2-4 hours) | $200-$500 | | TSANB permit | $50-$75 | | **Total** | **$340-$775** |

Adding a range outlet (50A, 240V):

| Component | Cost | |----------|------| | 6/3 NMD90 cable (25-50 ft) | $200-$450 | | 50A double-pole breaker | $25-$40 | | NEMA 14-50R outlet + box | $20-$35 | | Labour (3-5 hours) | $300-$650 | | TSANB permit | $50-$75 | | **Total** | **$595-$1,250** |

The range outlet costs significantly more primarily because of the heavier (and more expensive) 6/3 cable.

Common Complications That Add Cost

Panel is full: Adding a sub-panel costs $500-$1,000 additional. Alternatively, if the panel accepts tandem breakers, consolidating two 15A circuits onto one tandem frees up a space for $100-$150.

Panel is 100 amps: If adding the new 240V circuit exceeds the panel's load capacity, a service upgrade to 200 amps ($2,500-$4,500) becomes necessary. This is common when adding a range circuit to older New Brunswick homes that already have electric heat and a dryer.

Long cable run: Runs over 50 feet add $3-$6 per additional foot for the heavier cable plus extra labour for routing.

Concrete floor penetration: Running cable from a basement panel to a main-floor kitchen in a home built on a slab (less common in New Brunswick but found in some newer builds) requires core drilling through concrete — add $150-$300.

Can Homeowners Do This Themselves?

New Brunswick permits homeowners to do electrical work on their own primary residence, including installing 240V circuits. However, this job involves:

- Working inside a live electrical panel (even with the main breaker off, the service entrance lugs remain energized)
- Handling heavy-gauge wire that's difficult to strip, bend, and terminate correctly
- Ensuring proper torque on connections carrying 30-50 amps

Most homeowners should hire a licensed electrician for this work. The risk of a poor connection on a 50-amp circuit is significantly higher than on a 15-amp outlet — the heat generated by a loose 50-amp connection can melt the breaker and bus bar, potentially causing a panel fire.

If you do choose the homeowner route, you must still obtain a TSANB permit and have the work inspected before use. The TSANB inspector will verify wire gauge, breaker sizing, outlet type, grounding, and connection quality.

Timeline

A straightforward dryer or range outlet installation takes **half a day** for a licensed electrician. Add the TSANB inspection scheduling (5-10 business days after completion), and you should plan for **2-3 weeks from electrician booking to inspected and approved.** If a panel upgrade is needed, add another 1-2 weeks for NB Power coordination.

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Q14

Is knob and tube wiring in my Saint John home dangerous and does it need replacing?

Knob and Tube Wiring in Saint John Homes — Risks and Replacement

Knob and tube (K&T) wiring is still found in thousands of homes across Saint John, particularly in the uptown, south end, and west side neighbourhoods where many homes date back to the early 1900s. While knob and tube wiring that's in original, unmodified condition isn't inherently dangerous, it's a 100+ year old electrical system that was never designed for modern electrical loads — and that's where the real risk begins.

What Is Knob and Tube Wiring?

Knob and tube was the standard wiring method in New Brunswick homes from about 1890 through the 1940s. It uses individual hot and neutral wires run separately through the house, supported by ceramic "knobs" mounted to joists and passing through ceramic "tubes" where they go through framing members. The wire insulation is typically rubberized cloth that has become brittle with age.

Key characteristics:

- **No ground wire** — provides no equipment grounding, which means no protection against short circuits to metal appliance cases
- **Designed for low loads** — original circuits were rated for 15 amps on 14-gauge wire, intended for a few light bulbs per circuit (maybe 200-400 watts total per room)
- **Relies on air circulation** for heat dissipation — the wires were meant to be exposed to open air in wall and ceiling cavities

When Knob and Tube Becomes Dangerous

Insulation contact is the #1 fire risk. When blown-in or batt insulation is packed around K&T wiring — common in Saint John homes that were insulated during the energy efficiency retrofits of the 1970s-1990s — the wires can't dissipate heat. Under heavy loads, the wire temperature rises, the old rubber insulation degrades faster, and the risk of fire increases significantly. Many house fires attributed to "electrical" causes in older Maritime homes trace back to insulated-over K&T wiring.

Overloaded circuits are nearly universal in K&T homes. A single circuit that was designed to power 3-4 light bulbs in 1920 is now running a TV, computer, phone charger, space heater, and multiple lamps. The wiring heats up beyond its design capacity, especially at connection points.

Amateur modifications are extremely common and extremely dangerous. Over 100+ years, homeowners and handymen have spliced modern Romex wire to K&T conductors, often with nothing more than electrical tape — no junction box, no proper connectors. These hidden splice points are fire hazards.

Degraded insulation is inevitable at this age. The rubberized cloth insulation dries out, cracks, and falls away, leaving bare copper conductors exposed inside wall cavities. Any contact with wood framing, metal pipes, or other wires creates a short circuit risk.

Insurance Implications in New Brunswick

This is often the deciding factor for Saint John homeowners. **Most insurance companies in New Brunswick will either refuse to insure a home with active K&T wiring or charge a significant premium.** Some insurers require a certified electrical inspection confirming the K&T is safe before issuing a policy, while others won't

insure at any price.

If you're buying a home in Saint John with K&T wiring, expect your insurance options to be limited. If you're selling, the buyer's insurance requirements may force a rewire before closing — a significant negotiating point that can affect sale price by $10,000-$20,000.

Does It All Need Replacing?

The Canadian Electrical Code doesn't require you to rip out K&T wiring just because it exists. However, TSANB and the CEC do require that:

- Any new electrical work must use modern wiring methods (NMD90 cable)
- K&T wiring cannot be covered with insulation
- Circuits must not be overloaded beyond their rated capacity
- All connections must be made in approved junction boxes

A practical approach many Saint John homeowners take:

- **Have a TSANB-licensed electrician inspect the K&T system** — Cost: $200-$400 for a thorough inspection. They'll check insulation condition, identify amateur splices, verify circuit loading, and note any contact with building insulation.
- **Prioritize replacement of high-risk circuits** — Kitchen, bathroom, laundry, and any circuit covered by insulation should be rewired first. Cost: $1,500-$3,000 per circuit.
- **Full rewire when budget allows** — A complete rewire of a typical 1,200-1,800 sq ft Saint John home costs **$12,000-$25,000**, depending on the number of circuits, panel upgrade needs, and how accessible the wiring routes are. Homes with plaster walls (common in older Saint John houses) cost more because fishing new wire through plaster is more difficult than through drywall.

What a Full Rewire Includes

- Removal or disconnection of all K&T wiring
- New 200-amp electrical service and panel ($2,500-$4,500)
- New NMD90 copper wiring throughout the home
- Grounded 3-prong outlets in all locations
- GFCI protection in kitchen, bathroom, laundry, and outdoor locations
- AFCI protection on bedroom circuits (CEC requirement)

- Proper outlet spacing per current CEC (every 1.8 metres along walls)
- TSANB inspection and certificate of compliance
- Typically requires 3-5 days of work for a crew of 2 electricians

The Bottom Line

If your Saint John home has active knob and tube wiring, it's not an emergency that requires immediate action — but it should be on your priority list. Start with a professional inspection to understand the actual condition and risks, address any immediate hazards (exposed wires, insulation contact, overloaded circuits), and plan for a phased or complete rewire within the next few years. The combination of insurance requirements, safety improvements, and increased home value makes rewiring one of the best investments you can make in an older Maritime home.

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Q15

How do I wire a bathroom exhaust fan to the light switch or should it be separate?

Wiring a Bathroom Exhaust Fan to the Light Switch vs Separate Switch

This is a practical wiring question that comes up in almost every New Brunswick bathroom renovation. The Canadian Electrical Code (CEC) and New Brunswick building code both require mechanical exhaust ventilation in bathrooms, but how you wire the fan to the switch has real implications for energy use, moisture control, and code compliance.

The Two Main Wiring Options

Option 1: Fan and light on the same switch The fan turns on and off with the bathroom light. One switch controls both. This is the simplest wiring configuration — a single 14/2 NMD90 cable from the switch to a junction box in the ceiling, then short runs to the fan and light fixture.

Pros:

- Simplest wiring — one switch, one cable run
- Fan always runs when someone is in the bathroom (assuming they turn on the light)
- Lowest installation cost ($50-$100 less than separate switching)

  Cons:

- Fan runs even when not needed (quick hand wash, grabbing something from the cabinet)
- Fan stops immediately when the light is turned off — but moisture removal typically needs 15-20 minutes of runtime after a shower to prevent mould
- Higher energy consumption from unnecessary fan operation

  Option 2: Fan on a separate switch (recommended) The fan has its own dedicated switch next to the light switch. This requires running a 14/3 NMD90 cable (instead of 14/2) from the switch box to the ceiling, providing an extra conductor for independent fan control.

  Pros:

- Occupant controls the fan independently
- Can leave the fan running after leaving the bathroom
- Pairs well with a timer switch (see below)
- More energy efficient

  Cons:

- Requires 14/3 cable run (marginally more expensive — about $15-$20 extra for typical cable length)
- Extra switch in the gang box

  The Best Solution: Timer Switch for the Fan

  The ideal setup for New Brunswick bathrooms is a separate timer switch for the fan. Timer switches (like the Leviton LTB series or Lutron Maestro) let you press a button for 10, 20, 30, or 60 minutes of fan runtime. The fan runs for the selected period and shuts off automatically.

This is particularly important in New Brunswick where high humidity from Maritime air combined with poor bathroom ventilation leads to persistent mould problems. Mould remediation in a New Brunswick bathroom costs $1,500-$5,000 — a $40 timer switch that ensures the fan runs long enough after every shower is excellent insurance.

Installation: A timer switch fits in a standard single-gang box and requires a neutral wire. Most New Brunswick homes built after 1985 have neutral wires at switch boxes. Older homes may not — in that case, specify a timer switch that works without a neutral (fewer options but they exist, like the Lutron Maestro MA-T51).

What the Code Requires

The Canadian Electrical Code does not specifically mandate how the fan is switched — only that bathrooms have exhaust ventilation. However, the NB Building Code (which adopts the National Building Code) requires:

- Bathrooms must have mechanical ventilation capable of exhausting at least 25 litres per second (50 CFM) for a standard bathroom
- For larger bathrooms (over 100 sq ft), increase to 1 CFM per square foot
- The ventilation must exhaust to the outdoors — not into the attic, soffit, or wall cavity. This is a common code violation found during TSANB inspections in older NB homes

Wiring Details for DIY or Your Electrician

For separate switching with a timer:

- Run 14/3 NMD90 cable from the switch box to the ceiling fan/light location
- Black wire: light circuit (controlled by standard switch)
- Red wire: fan circuit (controlled by timer switch)
- White wire: neutral (shared)
- Bare copper: ground (shared)
- At the ceiling, connect the fan motor leads to the red wire and the light leads to the black wire
- The timer switch needs the neutral (white) wire connected at the switch box

For combined switching:

- Run 14/2 NMD90 cable from switch to ceiling
- Both fan and light connect to the black (hot) wire
- Single switch controls both

Fan Sizing for New Brunswick Bathrooms

Do not under-size the fan. For effective moisture removal in New Brunswick's humid Maritime climate:

- Standard bathroom (under 100 sq ft): 50-80 CFM
- Larger bathroom (100-150 sq ft): 80-110 CFM
- Bathroom with separate toilet room or large shower: 110-150 CFM

Choose a fan rated at 1.0 sone or less for quiet operation — nobody runs a loud fan long enough to remove moisture. Panasonic WhisperCeiling (0.3 sone) and Broan InVent series (0.8 sone) are widely available at Kent Building Supplies and Home Depot locations in Moncton, Fredericton, and Saint John. Expect to pay $100-$250 for a quality quiet fan.

Cost Summary

- Fan on same switch (basic): $150-$300 installed (fan + wiring)
- Fan on separate switch: $200-$350 installed
- Fan with timer switch: $240-$400 installed (includes $35-$50 timer switch)
- Adding ventilation to a bathroom with no existing fan: $400-$800 (includes cutting ceiling hole, ductwork to exterior, and exterior vent cap)

All bathroom electrical work in New Brunswick requires a TSANB permit if you are running new wiring or adding new circuits. Simply replacing a fan on existing wiring does not typically require a permit, but adding a new fan where none existed before does.

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Q16

Is the aluminum wiring in my 1970s home in Fredericton dangerous?

Aluminum wiring itself isn't inherently dangerous, but the connections where aluminum meets copper or connects to devices are a significant fire risk — and many 1970s homes in Fredericton and across New Brunswick were wired with aluminum branch circuit wiring during a period when copper prices were extremely high.

The core problem is that aluminum expands and contracts more than copper when it heats up during use. Over decades of thermal cycling, the connections at outlets, switches, light fixtures, and the panel loosen. Loose connections create resistance, resistance creates heat, and heat creates fires. According to the Consumer Product Safety Commission, homes with aluminum wiring are **55 times more likely** to have fire-hazard conditions at outlets and switches compared to copper-wired homes.

How to tell if you have aluminum wiring. Look at the wiring entering your electrical panel — aluminum wire has a silver colour compared to copper's distinctive orange-brown. You can also check the wire jacket printed text, which will say "AL" or "ALUMINUM" if it's aluminum. Many Fredericton homes built between 1965 and 1978 used aluminum for 15 and 20 amp branch circuits. The main service entrance cable being aluminum is normal and not a concern — it's the branch circuit wiring (the smaller wires going to outlets and switches) that's the issue.

Your options for remediation. The gold standard is a complete rewire to copper, which costs $8,000 to $15,000+ for a typical 1,500 square foot Fredericton home. However, a more cost-effective approach that's accepted by TSANB is **COPALUM crimping** or **AlumiConn connectors** — these are special connectors that create a safe, permanent transition from aluminum to copper at every connection point. Pigtailing with AlumiConn connectors typically costs $3,500 to $6,000 for a whole house, depending on the number of connections.

Insurance implications are real in New Brunswick. Many insurance companies will either refuse to insure a home with unremediated aluminum wiring or charge significantly higher premiums. If you're buying or selling a home in Fredericton with aluminum wiring, expect this to come up during the home inspection. Having the aluminum wiring professionally remediated with a TSANB inspection certificate can actually increase your home's value and make it far easier to insure.

Do not attempt DIY aluminum wiring repairs. The connections require specific listed connectors and techniques — standard wire nuts are not rated for aluminum-to-copper connections and can make the fire hazard worse. A licensed electrician experienced with aluminum wiring remediation is essential for this work.

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