OTTAWA GARAGES

Garage Electrical & Lighting

Electrical wiring, sub-panels, lighting, and ESA permit requirements for garages

21 Expert Answers from Garage IQ

ottawagarages.com/construction-brain

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Q1

How much does it cost to install a compressed air system in my Ottawa garage workshop?

A compressed air system for an Ottawa garage workshop typically costs $1,500 to $8,000 installed, depending on the compressor size, piping complexity, and electrical requirements. This wide range reflects everything from a basic portable setup to a comprehensive hard-piped system with multiple outlets throughout your workshop space.

The foundation of any garage air system is the compressor itself, and Ottawa's extreme temperature swings create specific considerations for compressor selection and placement. A quality two-stage, 80-gallon stationary compressor suitable for serious workshop use runs $2,000 to $4,000, while smaller single-stage units cost $800 to $1,500. However, compressors work harder in cold conditions — the air is denser and contains more moisture, which means your compressor will cycle more frequently during Ottawa's long winters and produce more condensation that needs to be managed.

Electrical requirements often drive up installation costs significantly. Most serious workshop compressors require 240-volt service, which means running a dedicated circuit from your electrical panel. In Ottawa, this electrical work must be performed by an ESA-licensed electrician and typically costs $800 to $1,500 depending on the distance from your panel to the compressor location. If your garage doesn't have adequate electrical service — many older garages have only 15 or 20-amp service — you may need a sub-panel upgrade, adding $1,500 to $3,000 to the project.

Hard piping throughout the garage provides the most professional setup and prevents the pressure drops you get with long hoses. A basic piping system with 3 to 4 outlets using black iron or aluminum pipe costs $800 to $2,000 in materials and labour. Copper piping costs more but resists corrosion better in Ottawa's humid summer conditions. The piping should include a main shutoff valve, pressure regulator, water separator, and individual shutoffs at each outlet.

Moisture management becomes critical in Ottawa's climate. The 60-degree temperature swings between summer and winter create significant condensation issues inside compressed air tanks and lines. A quality aftercooler and moisture separator system adds $300 to $800 but prevents water from reaching your air tools and causing rust damage. Many Ottawa workshop owners also install automatic tank drains to handle the condensation that inevitably accumulates.

Installation considerations specific to Ottawa include ensuring adequate ventilation around the compressor (they generate significant heat), protecting the unit from freezing if your garage isn't heated, and accounting for the noise factor — compressors are loud, and sound travels further in cold, dense air. Some homeowners install their compressor in an insulated enclosure or even a separate utility room to manage noise and temperature.

For a complete professional installation including a quality 80-gallon two-stage compressor, electrical work, and basic hard piping to 3-4 outlets, expect to invest $4,000 to $6,000. This represents excellent value for a serious workshop setup that will serve you for decades. You can browse garage contractors and workshop specialists through the Ottawa Construction Network directory at justynrookcontracting.com/directory to get specific quotes for your space and requirements.

Q2

How much does it cost to wire my detached garage for both a Level 2 EV charger and a 220V compressor?

Wiring a detached garage for both a Level 2 EV charger and a 220V compressor in Ottawa will typically cost $3,500 to $8,000, depending on the distance from your main electrical panel, the amperage requirements, and whether you need to upgrade your home's electrical service. This is a substantial electrical project that requires careful planning to ensure adequate capacity for both high-draw appliances.

The electrical demands are significant — a Level 2 EV charger typically draws 32 to 48 amps (requiring a 40 to 60-amp circuit), while a decent shop compressor needs 20 to 30 amps on 240V. Combined with garage lighting, receptacles, and a potential heater, you're looking at needing a 100-amp sub-panel in the garage minimum, fed by a substantial cable run from your main panel. In Ottawa's climate, this underground cable run must be buried below the frost line (1.2 to 1.5 metres deep) to prevent frost heaving from damaging the conduit and wiring.

The cost breakdown typically includes: underground cable and conduit from house to garage ($15 to $25 per linear foot depending on amperage and burial depth), 100-amp sub-panel installation in garage ($800 to $1,500), individual circuits for the EV charger ($400 to $600), compressor circuit ($300 to $500), GFCI-protected receptacle circuits ($200 to $400), and lighting circuits ($150 to $300). If your main panel needs upgrading from 100-amp to 200-amp service to handle the additional load, add another $2,500 to $4,000 to the project cost.

Distance is a major cost factor — a 30-foot run costs significantly less than a 100-foot run due to cable and trenching expenses. The cable size increases with distance to compensate for voltage drop, and larger cable costs substantially more. Winter installation adds complexity and cost since trenching frozen ground requires specialized equipment.

All of this work requires an ESA-licensed electrician and proper permits — this isn't negotiable and attempting unlicensed electrical work voids your home insurance. The electrician will need to calculate the electrical load, determine if your main service can handle the additional draw, and ensure proper grounding and bonding. When you're ready to move forward, you can browse qualified electrical contractors through the Ottawa Construction

Network directory to compare options and get detailed quotes for your specific garage setup.

Q3

How much does it cost to have an electrician install a ceiling fan in my Ottawa garage for summer?

Installing a ceiling fan in an Ottawa garage typically costs $300 to $800 for the electrical work, depending on whether you already have ceiling electrical or need new wiring run from the panel. If there's an existing ceiling light fixture with proper electrical box support, an ESA-licensed electrician can usually swap it for a fan in 1 to 2 hours at $150 to $200 per hour plus materials.

The complexity increases significantly if your garage ceiling has no existing electrical. Running new wire from the electrical panel to the ceiling location requires cutting into drywall, fishing wire through framing, installing a proper ceiling fan-rated electrical box, and patching the drywall afterward. This scenario pushes the total cost to $500 to $800 including the ESA permit, which is required for any new electrical circuits in Ontario.

Ceiling fan selection matters for Ottawa garages. Look for fans rated for damp or wet locations if your garage isn't heated year-round, as condensation is common during spring and fall temperature swings. A 52-inch fan works well for most two-car garages, while single-car garages can use 42 to 48-inch models. Fans with reversible motors are particularly useful — run them counterclockwise in summer to create cooling airflow, and clockwise in winter to gently circulate warm air from a heater down to floor level.

One important consideration: if your garage shares electrical circuits with the house, adding a ceiling fan might overload an existing circuit, especially if you're also running power tools, a garage door opener, or other equipment. An electrician can assess your current electrical capacity and recommend whether you need a dedicated circuit.

The timing works well for spring installation since you'll get maximum benefit during Ottawa's hot, humid summers when garage temperatures can exceed outdoor temps by 10 to 15 degrees.

Q4

How much does it cost to install an air compressor line throughout my Ottawa garage for tools?

Installing a permanent air compressor line throughout your garage typically costs $800 to $2,500 in Ottawa, depending on the size of your garage, the complexity of the piping layout, and whether you're doing the work yourself or hiring a contractor. A basic setup for a two-car garage with 4 to 6 outlet drops usually runs $1,200 to $1,800 installed.

This investment makes tremendous sense for Ottawa garage workshops because our long winters mean you'll be spending significant time indoors working on projects, vehicle maintenance, and repairs. A permanent air line eliminates the hassle of dragging hoses across the garage floor, prevents tripping hazards, and ensures consistent air pressure at every workstation. In Ottawa's extreme temperature swings, permanent copper or aluminum piping also performs much better than portable hoses, which can become stiff and crack in sub-zero temperatures.

The typical installation uses **3/4-inch or 1-inch copper pipe** for the main trunk line with **1/2-inch drops** to individual outlets. Copper pipe costs about $8 to $12 per foot, while fittings, valves, and quick-connect outlets add $25 to $50 per drop location. **Aluminum piping systems** like those from Prevost or Parker cost more upfront ($15 to $20 per foot) but install faster with push-fit connections and resist corrosion better than copper. The compressor itself needs a **moisture separator and pressure regulator** at the tank outlet, adding $150 to $300 to the project.

Installation involves mounting the piping to garage walls or ceiling joists with proper supports every 6 to 8 feet, installing a slight downward slope toward drain valves to prevent moisture accumulation, and running the main line in a loop configuration for consistent pressure. Most Ottawa garages benefit from outlets near the main workbench, vehicle parking areas, and any specialty work zones. If your garage isn't heated, consider insulating the air lines or installing them where they won't freeze, as ice blockages can damage both the piping and your tools.

The electrical requirements often add to the total cost. Most serious workshop compressors need **240-volt service**, which requires an ESA-licensed electrician and proper permits. This electrical work typically adds $500 to $1,200 to the project depending on your existing garage electrical setup and the distance from your main panel.

When you're ready to move forward with a permanent air system installation, you can browse garage contractors and workshop specialists through the Ottawa Construction Network directory to find professionals experienced with compressed air systems and garage electrical work.

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- Ottawa Integrated Security
- Elie The Carpet Guy Inc.

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Q5

How much does it cost to install a 100-amp sub-panel in a detached garage in Ottawa?

Installing a 100-amp sub-panel in a detached garage in Ottawa typically runs between $2,500 and $5,500, though the final number depends heavily on how far your garage sits from the main panel and whether you need to trench underground or can run overhead service.

The sub-panel itself costs between $300 and $600 for a quality 20- to 24-circuit panel from brands like Square D or Eaton. The bulk of the cost comes from labour, the copper wire run, conduit, and the ESA permit and inspection fees. For a garage that sits 15 to 25 metres from the house, most Ottawa electricians quote in the $3,000 to $4,500 range with everything included.

If your detached garage is within about 10 metres and you already have a clear path for conduit, you might land closer to $2,500. On the other hand, garages that are 30 metres or more from the main panel push costs toward $5,000 or beyond because copper wire at that gauge is expensive by the metre and longer runs may require upsizing wire to compensate for voltage drop.

The ESA permit for a sub-panel installation in Ontario is mandatory. Your electrician files the permit application, and the ESA inspector visits after the rough-in stage and again after final connections. The permit fee itself runs around $150 to $250 depending on the scope. Only an ESA-licensed electrical contractor can pull this permit, and the work must meet the Ontario Electrical Safety Code.

One factor Ottawa homeowners often overlook is the capacity of their existing main panel. If your house panel is already a 100-amp service, you cannot simply add a 100-amp sub-panel without upgrading the main service to 200 amps. That upgrade alone adds $2,000 to $4,000 to the project. Most homes built after the mid-1990s in Ottawa already have 200-amp service, so this is mainly a concern for older neighbourhoods like the Glebe, Westboro, or Alta Vista where original electrical may not have been upgraded.

For the underground run, your electrician will bury approved conduit at least 600 millimetres deep as required by code. The trench work can be done by hand for short runs but usually requires a small trencher for longer distances, adding $500 to $1,200 depending on soil conditions and landscaping that needs to be restored afterward.

What Size Sub-Panel Should You Choose

A 100-amp sub-panel gives you plenty of room for general garage use including lighting, outlets, a small compressor, and even a future EV charger. If you plan to heat the garage with a 240-volt heater or run heavy woodworking equipment, 100 amps is the right choice. For a garage that only needs lights and a few outlets, a 60-amp sub-panel at $1,800 to $3,200 can save you money while still meeting most needs.

Get at least two quotes from licensed Ottawa electricians and confirm the quote includes the ESA permit, inspection coordination, trenching, backfill, and panel termination at both ends. Some quotes only cover the panel installation and list the trench as an extra, which creates sticker shock later.

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Q6

What is the ESA permit process for doing electrical work in my Ottawa garage?

The Electrical Safety Authority handles all electrical permits and inspections in Ontario, and any electrical work in your Ottawa garage beyond simply replacing a light switch or outlet cover plate requires an ESA permit. Understanding how the process works helps you plan timelines and avoid surprises.

First, only an ESA-licensed electrical contractor can pull a permit for work in your garage. Ontario does allow homeowners to do their own electrical work and pull their own permits, but you must apply directly to ESA, demonstrate you own and live at the property, and the work must still pass the same inspections a contractor's work would face. Most Ottawa homeowners hire a licensed electrician because the liability and inspection process is simpler.

Your electrician submits the permit application through ESA's online portal before starting work. The application describes the scope, whether that is a new sub-panel, additional circuits, outlet installations, or a full garage wiring project. Permit fees vary based on the scope but typically fall between $100 and $300 for residential garage work. A simple circuit addition might be $100, while a full sub-panel with multiple circuits runs closer to $250.

Once the permit is issued, your electrician can begin work. The electrical code requires inspection at specific stages. For most garage projects, there are two inspections. The rough-in inspection happens after all wiring is run through studs, conduit, and boxes but before drywall or insulation covers anything. The ESA inspector checks wire gauge, box fill calculations, cable protection, grounding, and that everything meets the Ontario Electrical Safety Code. After passing rough-in, your electrician completes the finish work including receptacles, switches, fixtures, and panel terminations. Then the final inspection confirms everything is properly connected, labelled, and safe.

ESA inspectors in the Ottawa region typically schedule visits within three to five business days of a request, though busy periods in spring and summer can push that to seven or eight days. Your electrician coordinates inspection bookings, and someone needs to be available to provide access during the inspection window.

If the inspector finds deficiencies, they issue a deficiency notice listing what needs correction. Your electrician makes the fixes and books a re-inspection. Minor issues like a missing cable clamp or improper box fill are common and usually resolved quickly. The re-inspection is typically included in the original permit fee for the first follow-up.

The permit closes once the final inspection passes, and ESA issues a Certificate of Inspection. Keep this document with your home records because it proves the work was done to code, which matters when selling your home or filing insurance claims. Unpermitted electrical work in a garage can void your home insurance coverage if a fire starts in that area.

Timeline for a typical Ottawa garage electrical project from permit application to final inspection closure runs about two to four weeks, with the actual electrical work taking one to three days depending on scope and the rest being scheduling and inspection wait times.

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Q7

Are GFCI outlets required in garages in Ontario and where exactly do they need to go?

Yes, GFCI protection is required for all receptacles in garages in Ontario under the Canadian Electrical Code, which the Ontario Electrical Safety Code adopts. This applies to every 120-volt receptacle in your garage regardless of whether it is attached or detached, heated or unheated.

The requirement exists because garages are considered damp or wet locations. Concrete floors can conduct electricity, and the combination of moisture, power tools, and potentially wet hands creates a genuine shock hazard. A GFCI outlet or GFCI-protected circuit detects ground faults as small as five milliamps and trips in a fraction of a second, which is fast enough to prevent serious injury.

You have two ways to meet this requirement in your Ottawa garage. The first option is installing GFCI receptacles at each outlet location. These are the outlets with the test and reset buttons on the face, and they cost about $15 to $25 each. The second option is protecting an entire circuit with a GFCI breaker in your panel. A GFCI breaker costs $40 to $60 but protects every outlet on that circuit, so you can use standard receptacles downstream. Most electricians in Ottawa prefer GFCI breakers for new garage wiring because they are easier to test and maintain from the panel rather than reaching behind a workbench or freezer to find a tripped outlet.

There are a few practical considerations Ottawa homeowners should know about. Garage door openers are technically on a receptacle and should be GFCI protected per code. Some older garage door openers can trip GFCI protection on startup due to a brief current surge, though modern openers handle this fine. If you have a dedicated refrigerator or chest freezer in your garage, GFCI protection is still required, but you want to make sure you notice if it trips because a tripped GFCI means your freezer stops running. Placing the freezer on its own GFCI breaker with an audible alarm or checking it regularly is wise.

For 240-volt receptacles in the garage, such as those used for welders, EV chargers, or electric heaters, GFCI protection is also required under current code. A 240-volt GFCI breaker runs $80 to $150 depending on amperage. This requirement applies to new installations and major renovations but existing 240-volt outlets installed under a previous code edition are generally grandfathered until the circuit is modified.

If you are upgrading an older Ottawa garage that has no GFCI protection at all, an electrician can typically retrofit GFCI breakers into your existing panel for $150 to $400 depending on how many circuits serve the garage. This is one of the most cost-effective safety upgrades you can make, especially if your garage doubles as a workshop.

During an ESA inspection, the inspector will verify GFCI protection on every garage receptacle circuit. Missing GFCI protection is one of the most common deficiency items on residential inspections in Ottawa, so getting it right

the first time saves a re-inspection visit.

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Q8

How much does it cost to upgrade my garage lighting to LED in Ottawa?

Upgrading garage lighting to LED in Ottawa typically costs between $300 and $1,200 depending on the size of your garage, the number of fixtures, and whether you are doing a simple bulb swap or a full fixture replacement with improved layout.

The simplest upgrade is replacing existing fluorescent tubes or incandescent bulbs with LED equivalents. If your garage has standard fixtures, you can swap in LED tubes or screw-in LED bulbs for $10 to $30 per fixture in materials. For a two-car garage with four to six existing fixtures, the materials run $60 to $150 and most homeowners handle this themselves with no permit required since you are not modifying any wiring.

A more significant upgrade involves replacing old fixtures entirely with modern LED shop lights or integrated LED panels. A quality 4-foot LED shop light producing 4,000 to 5,000 lumens costs $30 to $60 each, and a typical two-car garage needs four to eight fixtures for good coverage. Installed by an electrician, including removing old fixtures and wiring new ones, the total for a full fixture replacement runs $500 to $1,000 for a standard two-car garage.

For a premium workshop or hobby garage, Ottawa homeowners sometimes invest in LED panel lights or high-bay fixtures that deliver 10,000 lumens or more per fixture. These cost $80 to $150 each and provide shadow-free lighting that makes detailed work much easier. A high-end lighting upgrade with six to eight premium fixtures, dedicated task lighting over a workbench, and a dimmer switch for flexibility runs $800 to $1,200 installed.

The energy savings from LED lighting are substantial. A typical garage running four 4-foot fluorescent fixtures at 128 watts total for three hours per day costs about $55 per year with Ottawa Hydro rates. The same light output from LEDs draws roughly 80 watts total, dropping that annual cost to about $35. The bigger savings come from bulb longevity since LED shop lights last 50,000 hours compared to 20,000 for fluorescent tubes, so you stop buying replacement tubes and ballasts.

Choosing the Right Colour Temperature

For garage use, a colour temperature between 4000K and 5000K works best. The 4000K range gives a neutral white that is comfortable for general use, while 5000K provides a daylight tone that is excellent for detail work and colour matching. Avoid going above 5000K as it creates a harsh, clinical feel that causes eye fatigue during longer sessions.

One thing to consider is that if you are adding new fixture locations rather than just replacing existing ones, that constitutes new electrical work and requires an ESA permit. Adding a few extra fixtures to improve coverage is a common add-on during a lighting upgrade and usually adds $200 to $400 to the project for the additional wiring and permit.

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- Somar Contracting Inc.
- The Deck Store Inc

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Q9

What does it cost to run underground power from my house to a detached garage in Ottawa?

Running underground power from your house to a detached garage in Ottawa costs between $2,000 and $6,000 depending on the distance, the amperage you need, soil conditions, and what is between your house and garage

that the trench needs to navigate around.

For a straightforward run of 15 to 20 metres with 60-amp service, most Ottawa electricians quote $2,000 to $3,500 all in. A 100-amp service over the same distance runs $3,000 to $4,500 because the heavier gauge copper wire is significantly more expensive per metre. Once you get beyond 25 metres, costs climb quickly due to both wire costs and the additional trenching labour, and runs over 30 metres typically land in the $4,000 to $6,000 range.

The Ontario Electrical Safety Code requires underground electrical conduit to be buried at a minimum depth of 600 millimetres below finished grade. Your electrician will use approved PVC electrical conduit, typically schedule 40 or schedule 80, with the wire pulled through after the conduit is laid and backfilled. At each end, the conduit rises out of the ground and connects to a weatherproof junction point or directly into the panel.

Trenching is a major cost factor and depends heavily on your Ottawa property. A clear, straight run across a lawn is the easiest scenario and can often be done with a walk-behind trencher in a few hours. Complications that increase cost include crossing a paved driveway, which requires saw-cutting and patching at $500 to $1,500 extra. Landscaping restoration for gardens, retaining walls, or established plantings that need to be carefully worked around adds cost. Hitting the Canadian Shield rock that sits close to the surface in parts of Ottawa west end, Kanata, and Stittsville can require a rock saw or hammer drill and adds $500 to $2,000. You also need to call Ontario One Call before any digging to have underground utilities marked at no charge, and your electrician should arrange this as part of the project.

The wire itself is the other big cost driver. For a 60-amp underground run, you need 6 AWG copper conductors, and for 100 amps you need 3 AWG or larger depending on the distance. Copper prices fluctuate, but as of early 2026 a 100-amp rated underground cable costs roughly $8 to $15 per metre. On a 25-metre run, the wire alone can be $400 to $750.

Permit and Inspection Requirements

This work requires an ESA permit because you are extending your home's electrical system to another structure. The ESA inspector will check the trench depth before backfill, the conduit connections at both ends, the wire sizing for the distance and load, and the sub-panel installation in the garage. Your electrician coordinates the inspection timing, and you should budget two to three weeks for the full process from permit to final sign-off.

One alternative some homeowners ask about is running an overhead service wire from the house to the garage on a mast. While this is technically possible and cheaper at $1,200 to $2,500, most Ottawa homeowners prefer underground because it looks cleaner, avoids clearance requirements over driveways, and is not vulnerable to ice storm damage, which Ottawa knows all too well.

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- Ottawa Garage Doors & Openers
- ARTEXPRO Tile & Finishes

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Q10

How much does it cost to install an EV charger in my garage in Ottawa?

Installing a Level 2 EV charger in your Ottawa garage costs between $1,500 and $3,500 total, with the charger unit itself running $500 to $1,200 and the electrical installation adding $800 to $2,500 depending on your existing panel capacity and the distance from the panel to the charger location.

A Level 2 charger operates on 240 volts and typically draws 30 to 48 amps, delivering about 30 to 60 kilometres of range per hour of charging. Popular units for home installation include the ChargePoint Home Flex, Grizzl-E, and Tesla Wall Connector, all of which are available through Ottawa electrical suppliers and online retailers.

The electrical installation cost depends almost entirely on your starting point. If your panel is in the basement directly below or adjacent to the garage, and you have spare capacity on a 200-amp service, the installation is straightforward. Your electrician runs a dedicated 240-volt circuit with the appropriate wire gauge, installs a breaker, mounts the charger, and connects everything. For this best-case scenario, expect $800 to $1,500 for the installation plus the ESA permit.

Costs increase when your panel is far from the garage, when you need to fish wire through finished walls, or when your existing electrical service does not have enough capacity. If your home has a 100-amp main service, which is common in older Ottawa neighbourhoods like Sandy Hill, Vanier, or Hintonburg, adding a 40-amp EV circuit may require a service upgrade to 200 amps. That upgrade adds $2,000 to $4,000 to the project and involves coordination between your electrician, Hydro Ottawa, and the ESA.

A newer option that avoids a panel upgrade is an EV charger with built-in load management. These units monitor your home's total electrical load and throttle the charging rate when other high-draw appliances are running. This allows you to install a Level 2 charger on a 100-amp service without overloading it. Units like the Emporia or certain ChargePoint models offer this feature and cost $600 to $900.

GFCI protection is required for EV charger circuits in garages under current code. Most dedicated EV circuits use a GFCI breaker in the panel, which adds $80 to $150 to the materials cost. Some charger units have built-in GFCI protection, but your electrician and the ESA inspector will confirm whether additional panel-level protection is needed.

The ESA permit for an EV charger installation typically costs $100 to $200 and follows the standard inspection process with a rough-in check if walls are open and a final inspection once everything is connected and energized.

Ottawa homeowners should also be aware of available rebates. The federal government and some provincial programs have offered EV charger installation rebates ranging from $200 to $600 in recent years. Check the Natural Resources Canada website and your local utility for current incentive programs, as these change

frequently.

For a detached garage, the costs are higher because you also need to run the 240-volt circuit underground or overhead to the garage, which adds $1,500 to $3,500 depending on distance. If you are already planning a sub-panel installation for a detached garage, adding the EV charger circuit at the same time is the most cost-effective approach since the trenching and conduit work is already being done.

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Q11

What are the best options for motion sensor lighting inside and outside my garage?

Motion sensor lighting is one of the most practical upgrades for a garage because it eliminates fumbling for switches with full hands and provides automatic security lighting outside. There are several approaches that work well for Ottawa garages, each suited to different needs and budgets.

For exterior motion lighting, wall-mounted LED flood lights with built-in motion sensors are the most popular choice. A quality dual-head LED motion light from brands like RAB, Lithonia, or Heath Zenith costs $40 to $120 and provides 2,000 to 4,000 lumens of bright white light when triggered. These mount above the garage door, beside entry doors, or at corners of the building and detect motion from 10 to 25 metres away depending on the model. For Ottawa's climate, choose fixtures rated for wet locations and temperatures down to minus 40, which most commercial-grade LED fixtures handle without issue. Cheap imported fixtures sometimes fail in extreme cold because their motion sensors use components that become sluggish below minus 20.

A step up from basic motion floods is an integrated LED wall pack with a photocell and motion sensor. These provide a low-level ambient glow at night via the photocell and ramp up to full brightness on motion. They cost $80 to $200 each and give your garage a more finished look than traditional dual-head floods.

For the garage interior, the simplest approach is replacing your existing light fixtures with LED fixtures that have built-in motion sensors. Several manufacturers make LED shop lights with integrated occupancy sensors for $40 to $80 each. You walk in, the lights come on, and they shut off automatically after 5 to 15 minutes of no movement. This works perfectly for a storage garage where you are in and out quickly and do not want to deal with switches.

If your garage serves as a workshop where you are stationary for long periods, pure motion sensors can be frustrating because they may turn off while you are sitting still at a workbench. In that case, a ceiling-mounted occupancy sensor connected to your existing light switch is a better option. These sensors detect both motion and micro-movements like the rise and fall of your chest while breathing, so they keep lights on as long as someone is in the room. A quality occupancy sensor from Leviton or Lutron costs $30 to $60 and replaces your existing wall switch, making it an easy retrofit.

For a comprehensive setup, many Ottawa homeowners combine approaches. Exterior motion floods on the driveway side and entry door side provide security and convenience. Interior occupancy sensors on the main garage lights handle everyday use. And a manual switch for dedicated task lighting over a workbench gives you direct control where you need it.

Installation costs vary based on whether you are replacing existing fixtures or adding new ones. Swapping an existing exterior light for a motion-sensor model is a direct replacement that most homeowners can do themselves since no new wiring is involved. Adding new exterior fixture locations or wiring interior occupancy sensors into existing circuits typically costs $100 to $250 per location if you hire an electrician. If new wiring is required, an ESA permit applies.

Smart motion sensors that connect to your phone through Wi-Fi or Zigbee are another option, allowing you to adjust sensitivity, timing, and receive alerts when motion is detected. Ring, Wyze, and Philips Hue all offer outdoor motion sensors in the $30 to $80 range that integrate with their respective smart home platforms.

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Q12

What is the best lighting layout for a garage workshop with good coverage and no shadows?

Getting shadow-free lighting in a garage workshop comes down to fixture placement, the type of light, and having enough total lumens to eliminate dark spots. A well-planned layout makes a noticeable difference in how comfortable and productive your workspace feels.

The general rule for garage workshop lighting is 50 lumens per square foot at a minimum, with 70 to 80 lumens per square foot being ideal for detailed work like woodworking, automotive repair, or painting. For a standard two-car garage of roughly 400 square feet, that means 20,000 to 32,000 total lumens. That sounds like a lot, but four to six modern LED shop lights easily deliver those numbers.

The most effective layout uses parallel rows of linear LED fixtures running the length of the garage, positioned so they are offset from where you typically stand. For a two-car garage that is about 6 metres wide, two rows of fixtures spaced 1.5 to 2 metres apart and centred in the space provide excellent even coverage. Each row should have two to three 4-foot LED shop lights producing 4,500 to 5,500 lumens each.

The key to eliminating shadows is placing light sources on both sides of where you work. A single fixture directly overhead creates shadows on the side of whatever you are working on facing away from the light. Two fixtures flanking your work area cast light from both sides, filling in each other's shadows. This is why two parallel rows work so much better than a single centred row even if the total lumens are the same.

For workbench areas, add dedicated task lighting in addition to the overhead general lighting. An LED strip mounted under a shelf above the workbench or a swing-arm LED work light provides focused, shadowless illumination right where your hands are. This targeted light at 800 to 1,500 lumens supplements the overhead lighting and makes detail work much easier.

Ceiling height affects your layout plan. Most Ottawa garages have 8-foot ceilings, which means fixtures are close to your work surface and each fixture covers a smaller cone of light. In an 8-foot ceiling garage, more fixtures spread across the ceiling work better than fewer high-output fixtures, because the light does not have enough distance to spread out before hitting the floor and workbench. If your garage has 9 or 10-foot ceilings, fewer higher-output

fixtures can provide the same coverage.

Flat panel LED fixtures and wraparound LED fixtures both produce more diffuse light than bare tube-style shop lights, which helps reduce harsh shadows. Wraparound fixtures have a lens that disperses light in a wider pattern and typically cost $40 to $80 each. They produce a softer, more even light that many workshop users prefer over the raw brightness of open shop lights.

Colour rendering index matters for workshops where colour accuracy is important, such as painting, staining, or finishing. Look for fixtures with a CRI of 90 or above. Standard shop lights often have a CRI of 80 to 82, which is adequate for general work but makes colours look slightly washed out. High-CRI fixtures cost 20 to 30 percent more but the difference is visible and worthwhile if you do any finish work.

Finally, consider adding a switched circuit for half your fixtures so you can run full lighting when working and half lighting for casual use. This reduces energy consumption for quick trips to grab a tool and extends the life of your fixtures.

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Q13

How many electrical circuits does a typical garage need and what should each one be for?

The number of circuits your garage needs depends entirely on how you use the space, but even a basic garage benefits from more circuits than most people expect. Planning adequate circuits during initial wiring saves you from running extension cords and tripping breakers later.

A basic attached garage used only for parking and light storage needs a minimum of two circuits. One 15-amp circuit handles the lighting and garage door opener. A second 20-amp circuit serves the general-purpose receptacles along the walls. This meets the Ontario Electrical Safety Code minimum requirements and costs the least to install, but it limits what you can do in the space.

A garage that doubles as a workshop or hobby space should have four to six circuits as a practical starting point. A dedicated 20-amp circuit for lighting keeps your lights on even if you trip a breaker on an outlet circuit with a power tool. Two or three 20-amp circuits for receptacles along different walls give you the ability to run multiple tools without overloading a single circuit. Splitting your receptacles across separate circuits means a table saw on the east wall and a dust collector on the west wall are on independent circuits and will not trip each other. A dedicated 20-amp circuit for a garage refrigerator or chest freezer is also wise because you do not want a tripped breaker from a power tool shutting off your freezer without you noticing.

If you plan to use 240-volt equipment, each piece typically needs its own dedicated circuit. Common 240-volt garage loads and their circuit requirements include an EV charger at 40 to 50 amps on a dedicated circuit, a 240-volt garage heater at 20 to 30 amps on a dedicated circuit, a welder at 30 to 50 amps on a dedicated circuit, and an air compressor over 2 horsepower at 20 to 30 amps on a dedicated circuit. Each of these 240-volt circuits adds to your total circuit count and your sub-panel requirements.

A well-equipped workshop garage typically needs eight to twelve circuits when you account for all the 120-volt and 240-volt loads. This is why a 100-amp sub-panel with 20 to 24 circuit spaces is the standard recommendation for a serious workshop garage rather than a smaller 60-amp panel with 12 spaces.

Here is a practical circuit plan for a two-car workshop garage that covers most needs. Circuit one is a 15-amp lighting circuit for all overhead fixtures. Circuit two is a 20-amp circuit for receptacles along the front wall and garage door opener. Circuit three is a 20-amp circuit for receptacles along the back wall and workbench. Circuit four is a 20-amp circuit for receptacles along the side wall. Circuit five is a 20-amp dedicated circuit for a refrigerator or freezer. Circuit six is a 20-amp or 30-amp 240-volt circuit for a garage heater. Circuit seven is a 40-amp 240-volt circuit for an EV charger. Circuit eight is a 30-amp 240-volt circuit for a welder or large compressor. That gives you eight circuits on a 100-amp sub-panel with room to add more later.

The cost to wire a garage with this level of service in Ottawa, including the sub-panel, all circuits, receptacles, and the ESA permit, runs roughly $4,000 to $7,000 depending on the garage size and the distance from the main panel. Planning all the circuits at once during initial wiring is far more cost-effective than adding circuits one at a time later, because each return visit by an electrician involves a new permit, new inspection, and minimum service charges.

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Q14

What electrical work is needed for a heated garage and how much does 240-volt heater installation cost in Ottawa?

Heating a garage in Ottawa requires electrical work that goes beyond simply plugging in a heater, and the cost to set up a proper 240-volt garage heating circuit runs between $800 and $2,500 depending on your existing electrical setup and the heater type you choose.

Most effective garage heaters for Ottawa winters run on 240 volts because they produce significantly more heat than 120-volt portable units. A 240-volt electric garage heater draws between 20 and 40 amps depending on the wattage, and that requires a dedicated circuit from your panel with appropriately sized wire, a breaker, and proper connections at the heater location.

The most common options for electric garage heat in Ottawa are ceiling-mounted forced air heaters and infrared radiant heaters. Ceiling-mounted forced air units like the Fahrenheat or Dimplex models range from 4,000 to 7,500 watts, cost $200 to $600 for the unit, and heat a two-car garage effectively in most conditions. Infrared heaters mount high on the wall or ceiling, heat objects directly rather than the air, and work well in garages where the door opens frequently because they warm you and your work surface rather than the air that escapes. Infrared units cost $300 to $800 and draw similar amperage.

The electrical installation for a 240-volt garage heater involves running a dedicated circuit from your panel to the heater location. For an attached garage where the panel is on the other side of the wall, this is relatively simple and costs $800 to $1,500 including the ESA permit, a 30-amp double-pole breaker, 10 AWG wire run, and the heater hookup. For a detached garage that already has a sub-panel, adding a 240-volt heater circuit from the sub-panel costs $400 to $800. If your detached garage does not have a sub-panel yet, you need to factor in that full project cost first.

A 5,000-watt heater on a 240-volt circuit draws about 21 amps, so it runs on a 30-amp circuit with 10 AWG wire. A 7,500-watt heater draws about 31 amps and needs a 40-amp circuit with 8 AWG wire. Your electrician sizes the circuit based on the specific heater you choose, and this must be determined before the installation begins because the wire gauge and breaker size are specific to the load.

The Ontario Electrical Safety Code requires a disconnect switch for a hardwired heater that is within sight of the unit. This is typically a small disconnect box mounted on the wall near the heater and adds $50 to $100 to the installation. The ESA inspector will check for this during the inspection.

For running costs, a 5,000-watt electric heater running four hours per day through Ottawa's heating season of roughly October through April costs approximately $550 to $700 per year at current Hydro Ottawa rates. A 7,500-watt unit under the same conditions costs $800 to $1,050. These numbers assume you are on Hydro Ottawa's time-of-use pricing and running the heater mostly during off-peak hours. Running the heater during on-peak hours significantly increases the cost.

Insulation Matters More Than Heater Size

Before investing in a large heater, make sure your garage is reasonably insulated. An uninsulated garage in Ottawa loses heat so quickly that even a powerful heater struggles to maintain a comfortable temperature when it is minus 25 outside. Insulating the garage door with a kit at $100 to $200, insulating walls to R-12 or better, and sealing gaps around the door frame make a dramatic difference in how effectively any heater performs. A well-insulated two-car garage can often get by with a 4,000 to 5,000-watt heater, while an uninsulated garage of the same size might need 7,500 watts and still feel cold on the worst Ottawa winter days.

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Q15

When do I need a licensed electrician for garage work in Ottawa and what can I legally do myself?

Ontario law is unambiguous on this point, and it is more restrictive than many homeowners realize. Under the **Ontario Electrical Safety Code** and the regulations enforced by the **Electrical Safety Authority (ESA)**, essentially all electrical installation and modification work in Ontario must be performed by a **Licensed Electrical Contractor (LEC)** or a homeowner who has obtained an owner-authorization permit from the ESA. In practice, this means you need a licensed electrician for virtually every electrical task in your garage beyond changing a light bulb.

Specifically, you **need a licensed electrician and an ESA permit** for: adding or relocating electrical outlets, installing new lighting fixtures where no junction box currently exists, running a new circuit from your house panel to the garage, installing or upgrading a sub-panel in the garage, wiring a 240-volt outlet for a welder, compressor, or car lift, installing an EV charger circuit, adding exterior lighting or motion-sensor lights that require new wiring, installing a garage heater that is hardwired (not plug-in), and upgrading the electrical service to support additional garage loads.

The ESA does allow homeowners to perform their own electrical work under an **owner-authorization permit**, but there are important conditions. You must own and live in the home, the work must be for your own residence (not a rental property), and the work is still subject to ESA inspection. You cannot hire an unlicensed person to do the work under your owner permit — that is a violation. The permit costs **$100 to $300** depending on scope, and you need to pass the same inspection that a licensed electrician's work would face. Most homeowners who pursue this route find that the ESA inspector holds owner-performed work to a high standard, and the failure rate on owner-performed inspections is significantly higher than for professional work.

What you **can legally do without any permit or electrician** is limited to: replacing a light bulb or fluorescent tube, replacing a plug-in device (swapping one plug-in heater for another, for example), replacing a switch or outlet cover plate, and plugging in portable equipment. You can also replace a light fixture on an existing junction box in some circumstances, though the ESA's guidance on this has been inconsistent and the safest approach is to have an electrician do it.

The consequences of doing unpermitted electrical work are serious. If the ESA discovers unpermitted work — which can happen during a home sale inspection, an insurance claim investigation, or a fire investigation — you face **fines of up to $50,000** and can be required to open up walls and ceilings for retroactive inspection at your own expense. Your **homeowner's insurance** may deny coverage for any claim connected to unpermitted electrical work. And if unpermitted electrical work causes a fire that injures someone, you face potential **personal liability** that insurance will not cover.

The cost of hiring a licensed electrician for common garage electrical work in Ottawa is reasonable enough that the risk of DIY rarely makes financial sense. Adding **two to four outlets** to an existing garage circuit costs **$200 to $500**. Running a **new dedicated circuit** from your house panel to the garage runs **$400 to $800**. Installing a **sub-panel** in the garage costs **$800 to $1,500**. An **EV charger circuit** (240-volt, 40 or 50 amp) typically costs **$600 to $1,200** depending on the distance from the panel and whether your panel has capacity.

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Q16

What electrical code violations do Ottawa homeowners commonly make in garage renovations?

Electrical code violations in garage renovations are among the most dangerous mistakes Ottawa homeowners make, both because of the immediate safety risks and because the **Electrical Safety Authority (ESA)** takes enforcement seriously in Ontario. Whether you are finishing a garage into a workshop, adding circuits for power tools, or wiring up a car charger, the same violations come up again and again during ESA inspections in Ottawa.

The most common violation is **performing electrical work without an ESA permit**. Every electrical installation, modification, or extension in Ontario requires an ESA permit, and the work must be done by a **licensed electrician** — or by the homeowner if they pull the permit themselves and do the work on their own principal residence. The key point many homeowners miss is that even homeowner-performed electrical work must be **inspected and approved by the ESA** before it is energized and covered up. Wiring a garage without a permit and without inspection is not just a regulatory issue — it is a fire and electrocution hazard that will also void your home insurance if something goes wrong.

The second most frequent violation involves **GFCI (Ground Fault Circuit Interrupter) protection**. The Ontario Electrical Safety Code requires GFCI protection on **all receptacles in a garage**, regardless of their height above the floor. This is a change from older code editions that only required GFCI protection at specific heights or near water sources. Homeowners renovating older garages often add standard duplex outlets without GFCI protection, or they install GFCI outlets only near a sink and leave the rest of the garage unprotected. Every outlet in the garage — including 240-volt receptacles for welders, compressors, and EV chargers — must be on a GFCI-protected circuit.

Improper wiring methods are the third major violation category. In a garage, any wiring installed below **1.5 metres (about 5 feet) above the floor** is considered vulnerable to physical damage and must be protected. This means using **armoured cable (AC90 or ACWU)**, **conduit (EMT or rigid)**, or running NMD (Romex) behind a finished wall. Homeowners frequently surface-mount NMD cable along garage walls at workbench height without any protection, which is a direct code violation. The reasoning is practical — a garage is a workspace where lumber, tools, and equipment can impact exposed wiring, and NMD cable's plastic sheathing offers no protection against puncture or abrasion.

Overloaded circuits are another frequent problem. Homeowners add outlets to existing circuits without calculating the total load, and then plug in table saws, compressors, space heaters, and car chargers that draw far more current than the circuit can safely deliver. A standard 15-amp circuit can deliver **1,440 watts** of continuous load (80% of the 1,800-watt maximum). A single table saw can draw 1,800 watts by itself. The result is breakers that trip

constantly — or worse, connections that overheat without tripping the breaker because the wiring connections are poor. **Dedicated circuits** for high-draw equipment and a properly sized **sub-panel** in the garage are the safe solutions.

Improper bonding of metallic components is a violation that inspectors catch frequently. Metal garage door tracks, metal conduit, equipment frames, and sub-panel enclosures must all be properly bonded to the grounding system. Unbonded metal components can become energized if a fault occurs, creating an electrocution hazard. The bonding conductor must be continuous and properly sized for the circuit it protects.

Insufficient lighting circuit separation is a subtler violation. The code requires that garage lighting be on a **separate circuit from the receptacles** so that a tripped breaker on an overloaded tool circuit does not plunge the garage into darkness — a genuine safety hazard when you are working with power equipment. Many homeowner renovations daisy-chain lights and outlets on the same circuit, which passes in some rooms but fails code requirements in garages and workshops.

Finally, **inadequate panel access and working space** causes violations when homeowners install a sub-panel in the garage and then build shelving, workbenches, or storage in front of it. The code requires a minimum of **1 metre (3 feet) of clear working space** in front of any electrical panel, extending from floor to ceiling height, to allow safe access during maintenance and emergencies.

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Q17

What is the best lighting for a garage in Ottawa when comparing LED, fluorescent, and high-bay fixtures?

Garage lighting is one of those decisions where the upfront cost difference is relatively small but the long-term cost difference and day-to-day usability gap is enormous. Ottawa's cold winters add a specific wrinkle to this comparison because some lighting technologies perform poorly in unheated or partially heated garages when temperatures drop.

Fluorescent tube lights, specifically T8 four-foot tubes in standard shop light fixtures, were the default garage lighting for decades and you will still find them in most older Ottawa garages. A basic two-tube four-foot fluorescent fixture costs $25 to $50 at Home Depot or Rona, and a typical two-car garage needs four to six fixtures for adequate light, putting the total at $100 to $300 for fixtures and bulbs. The light output is decent at around 6,000 to 7,000 lumens per four-foot two-tube fixture. Here is the problem for Ottawa. Standard fluorescent tubes struggle to start and perform poorly in cold temperatures. Below about five degrees, a T8 fluorescent takes significantly longer to reach full brightness, and below minus ten many tubes will not start at all or produce a dim flickering light that is essentially useless. If your garage is unheated, this means your lights barely work during the exact months when natural daylight is shortest and you need artificial light most. Cold-weather rated fluorescent ballasts exist but they add cost and still do not perform as well as LED in extreme cold.

LED shop lights have become the obvious choice for Ottawa garages and the price has dropped dramatically over the past few years. A four-foot LED shop light producing 4,000 to 5,000 lumens costs $25 to $60, roughly the same as fluorescent now. Higher output LED fixtures pushing 8,000 to 10,000 lumens run $40 to $100 each. For a two-car garage, four to six fixtures totalling $100 to $600 provides excellent light coverage. The critical advantage for Ottawa is that LEDs work perfectly in extreme cold. They actually become slightly more efficient as temperatures drop, which is the opposite of fluorescent. Your LED shop lights will fire up instantly at full brightness at minus thirty just as well as they do in August. LED fixtures also last 50,000 hours compared to 20,000 for fluorescent tubes, which means roughly ten to fifteen years of typical garage use before replacement. Energy consumption is 30 to 50 percent lower than equivalent fluorescent output.

High-bay LED fixtures are the premium tier, designed for spaces with ceiling heights of ten feet or more. These put out 15,000 to 30,000 lumens per fixture and cost $80 to $250 each. For a standard two-car garage with eight or nine foot ceilings, high-bay fixtures are overkill and the light can actually be harsh because the fixtures are designed to throw light from a greater height. Where they make sense is in garages with vaulted ceilings, oversized garages, or garages used as serious workshops where you want maximum visibility over workbenches and equipment. Two to four high-bay fixtures can light up a two-car garage like a professional shop for $160 to $1,000.

Practical Setup for an Ottawa Garage

For most Ottawa two-car garages, four to six LED shop lights in the 5,000 lumen range provide excellent general lighting at a total cost of $100 to $360. Mount them evenly across the ceiling to eliminate shadows. If you have a dedicated workbench area, add one or two under-cabinet LED strip lights or an adjustable LED task light for focused work. Running six 40-watt LED shop lights for four hours a day costs roughly $3 to $4 per month on Ottawa Hydro rates, compared to $6 to $8 for equivalent fluorescent output.

If you are replacing existing fluorescent fixtures, many LED shop lights are designed as direct replacements that use the same hanging hardware. The swap takes about fifteen minutes per fixture and the difference in cold-weather performance is immediately obvious the first time you walk into your garage on a January morning and the lights come on at full brightness instantly.

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Q18

How much does it cost to install a Level 2 EV charger in my Ottawa garage, and what's involved?

Installing a Level 2 EV charger in an Ottawa garage is one of the most common electrical upgrades homeowners are making right now, and the total cost typically falls between $1,500 and $3,500 depending on your existing electrical setup and the charger you choose. That range covers the charger unit itself, the electrical work, and the permit, but the final number depends heavily on how far your electrical panel is from where you want the charger mounted and whether your panel has the capacity to support it.

The charger unit is the straightforward part. A quality 240-volt Level 2 home charger from brands like ChargePoint, Grizzl-E, or Tesla Wall Connector costs between $500 and $900. Most Ottawa homeowners go with a 48-amp unit, which delivers about 11.5 kilowatts and can fully charge a typical EV battery overnight in six to eight hours. The

Grizzl-E is particularly popular in Ottawa because it is made in Ontario, handles our extreme cold without issues, and is one of the more affordable options at around $500.

The electrical installation is where the cost varies. A Level 2 charger requires a dedicated 240-volt circuit, typically on a 60-amp breaker for a 48-amp charger. Your licensed electrician needs to run appropriately sized wire from your electrical panel to the charger location, install the breaker, and mount the charger. If your panel is in the basement directly below or behind the garage wall, the wire run is short and the labour is minimal, putting the installation portion at $600 to $1,200. If the panel is on the opposite side of the house and the wire needs to run through the basement ceiling, across the house, and up into the garage, you are looking at $1,200 to $2,000 for the electrical work alone.

Ottawa requires an electrical permit for EV charger installation, which costs approximately $100 to $150 through the Electrical Safety Authority. Your electrician should pull this permit and arrange the inspection as part of the job. The ESA inspector will verify that the circuit is properly sized, the wiring is correct, and the installation meets the Ontario Electrical Safety Code.

One decision you should discuss with your electrician is whether to hardwire the charger or install a NEMA 14-50 outlet that the charger plugs into. A hardwired installation is cleaner and some chargers perform better hardwired, but a plug-in setup lets you easily swap chargers in the future or take your charger with you if you move. Both approaches are code-compliant and cost roughly the same to install.

For the timeline, most Ottawa electricians can complete an EV charger installation in half a day. The permit inspection usually happens within a week or two after installation. From first call to a fully operational charger, expect about two to four weeks, with most of that being scheduling lead time rather than actual work.

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Q19

Is it worth running Ethernet and network wiring to my garage, or should I just rely on WiFi?

This is a question that comes up constantly as Ottawa homeowners add more connected devices to their garages, from smart openers and security cameras to EV chargers and workshop computers. The short answer is that WiFi works fine for most basic smart devices, but if you are setting up security cameras, a workshop computer, or plan to use the garage as a workspace, running Ethernet is a significant upgrade in reliability and performance that you will appreciate every day.

The fundamental issue with WiFi in garages is that the signal has to pass through at least one exterior wall, and often through a fire-rated wall assembly with metal vapour barriers, steel studs, or foil-faced insulation that degrades the signal significantly. Detached garages are even worse because the signal has to cross an open gap and penetrate two exterior walls. Many Ottawa homeowners find that their garage WiFi is spotty, slow, or drops out entirely in the far corners of the space, which causes smart devices to become unreliable exactly when you want them working.

Running a couple of Ethernet cables from your home router or network switch to the garage solves this permanently. Cat6 cable is the current standard and supports speeds up to 10 gigabits per second, which is far more than any current device needs and ensures the wiring will be adequate for decades. For an attached garage, the cable run is usually straightforward, going through the shared wall or through the basement and up into the garage. For a detached garage, the cable typically runs underground in conduit from the house to the garage, following the same path as electrical service if one exists.

Once you have Ethernet in the garage, you can connect a small WiFi access point that gives you strong, reliable wireless coverage throughout the garage and even into the driveway and yard. This is a much better approach than trying to extend your house WiFi signal into the garage with repeaters, which cut your bandwidth in half and add latency. A dedicated access point connected via Ethernet to your main network gives you full-speed WiFi exactly where you need it.

The practical wiring approach for most Ottawa garages is to run two Cat6 cables from the house to the garage, terminated at a wall plate near where you would mount a WiFi access point or use a wired device. Two cables gives you one for the access point and one spare for a future wired device, or you can add a small network switch in the garage to expand from there. The cable itself is inexpensive at roughly $0.30 to $0.50 per foot for quality Cat6.

If you are already doing other renovation work in the garage or house that has walls open, adding Ethernet at the same time is a no-brainer since the cable cost is minimal and the labour to fish it through open walls is trivial. If the walls are finished and you need to retrofit, the job is more involved but still very doable. Most low-voltage installers

in Ottawa charge $200 to $500 to run one or two Ethernet cables from your house to an attached garage, or $400 to $900 for a detached garage that requires trenching for underground conduit.

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Q20

Does my electrical panel need an upgrade to support an EV charger in my Ottawa garage?

This is one of the first things your electrician will assess when you call about an EV charger installation, and the answer depends entirely on your existing panel's capacity and how much of it is already being used. Roughly half of Ottawa EV charger installations proceed without a panel upgrade, and the other half need some level of electrical work beyond just adding a breaker and running wire.

A standard Level 2 EV charger draws 40 to 48 amps on a 240-volt circuit, which requires a 50 or 60-amp breaker in your panel. The question is whether your panel has both the physical space for that breaker and the electrical capacity to support the additional load. Most Ottawa homes built after 2000 have a 200-amp main panel, which generally has enough total capacity for an EV charger alongside normal household loads. Homes built in the 1970s through 1990s often have 100-amp or 125-amp panels, and these are the ones that most frequently need attention.

Your electrician will perform a load calculation, which adds up the electrical demand of everything in your home, including the heating system, air conditioning, stove, dryer, hot water heater, and all the general circuits, then compares that total to the panel's rated capacity. If adding a 48-amp EV charger pushes the calculated load beyond what the panel can support, you have a few options.

A full panel upgrade from 100-amp to 200-amp service is the most comprehensive solution and costs between $2,500 and $5,000 in Ottawa. This involves replacing the panel itself, upgrading the main breaker, and often upgrading the service entrance cable from the meter to the panel. Your utility connection from the street to the meter may also need upgrading, which Hydro Ottawa handles but which adds time and coordination to the project. A full panel upgrade typically takes one to two days and requires an ESA permit and inspection.

If your panel has adequate total capacity but no physical space for a new 60-amp breaker, a sub-panel can be added adjacent to the main panel to create additional breaker slots. This costs $800 to $1,500 and is less disruptive than a full service upgrade. Alternatively, tandem breakers can sometimes free up space in the existing panel, though this depends on the panel model and which slots can accept tandem breakers.

A third option that has become increasingly popular is a load management device, sometimes called an energy management system or a share circuit. These devices monitor your home's total electrical usage in real time and automatically throttle the EV charger when other high-draw appliances are running, then ramp it back up when capacity is available. This lets you install a 48-amp charger on a panel that technically cannot support it running simultaneously with everything else, because the device ensures it never actually does. Load management devices cost $300 to $600 installed and can sometimes eliminate the need for an expensive panel upgrade entirely.

For Ottawa homeowners planning ahead, if you are doing any significant electrical work on your home, upgrading to a 200-amp panel now even if you do not yet own an EV is a smart investment. The cost difference between upgrading during other electrical work versus doing it as a standalone project later is substantial, and with EV adoption accelerating across Ontario, the resale value benefit of having an EV-ready garage is real and growing.

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Q21

Can I install a smart thermostat to control my heated garage, and what works best in Ottawa?

A smart thermostat in a heated garage is one of those upgrades that pays for itself surprisingly quickly, because the biggest energy waste in a heated garage is maintaining temperature when nobody is using the space. A standard thermostat just holds whatever temperature you set, which means your garage heater runs all night and all day at the same level whether you are in there working or sleeping in the house. A smart thermostat lets you automate setback schedules, control the temperature remotely, and in some cases learn your usage patterns to optimize heating automatically.

The thermostat options for a garage depend on what type of heating system you have. For electric baseboard heaters or electric forced-air heaters that run on 240-volt line voltage, you need a line-voltage smart thermostat. The Mysa or Sinope line-voltage smart thermostats are the most popular options in Ottawa and cost $100 to $180 each. They connect to your WiFi network and integrate with Google Home, Amazon Alexa, and Apple HomeKit. These replace your existing line-voltage thermostat with no additional wiring, and installation takes about fifteen minutes if you are comfortable working with 240-volt wiring, or $80 to $150 for an electrician to do it.

For gas-fired garage heaters, whether natural gas or propane, you need a low-voltage thermostat, which is the same type used in home HVAC systems. This opens up the full range of popular smart thermostats including the Google Nest, Ecobee, and Honeywell Home T9. These cost $130 to $300 and connect with standard 24-volt thermostat wiring. If your gas heater currently has a basic thermostat with two wires, a smart thermostat will work with that same wiring in most cases, though some models appreciate a common wire for power and may need a small adapter if one is not present.

The most practical smart thermostat feature for a garage is scheduling combined with remote control. A typical useful schedule for an Ottawa garage that doubles as a workshop might look like this: hold eight degrees Celsius overnight and during the workday to prevent freezing and keep the space from getting brutally cold, then warm up to sixteen degrees at 5 PM on weekdays when you are likely to use the space after work, and back down to eight at 10 PM. On weekends, the warm period might start earlier. With a smart thermostat, you adjust this schedule from your phone in thirty seconds, and if plans change and you want to head out to the garage at an unusual time, you bump the temperature up from the couch and it is warming before you walk out there.

Geofencing is another feature that some homeowners find useful, where the thermostat detects when you leave the house and automatically drops to the setback temperature, then warms up when you return home. This works well if your garage usage correlates with being home, though it is less useful if you want the garage warm at a specific time regardless of when you get home.

The energy savings from a smart thermostat in a heated Ottawa garage are meaningful. Dropping from a constant fifteen degrees to an eight-degree setback for the sixteen hours a day when the garage is unoccupied reduces heating costs by roughly thirty to forty percent compared to maintaining a constant temperature. On a gas-heated garage that costs $150 to $250 per month to heat through an Ottawa winter, that is $50 to $100 per month in savings, meaning the thermostat pays for itself within the first winter season.

One practical tip for Ottawa garages: mount the thermostat on an interior wall away from the garage door, ideally on the shared wall with the house if the garage is attached. Mounting it near the garage door exposes it to cold drafts every time the door opens, which gives it a false reading and causes the heater to run more than necessary.

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