

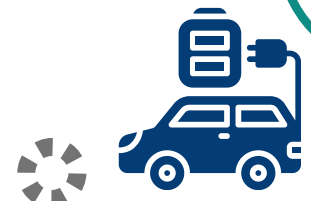


# ELECTRIC VEHICLE CAREER PATHWAYS REPORT

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# Electric Vehicle Career Pathways

The EV Career Pathways report provides pathways for those interested in transitioning from traditional manufacturing or **internal combustion engine vehicle (ICE-V)** production jobs to **electric vehicle (EV)** careers with transferable skillsets. With such a strong automotive manufacturing landscape, Windsor-Essex is the ideal region for those currently employed in traditional automotive manufacturing jobs to transition into EV careers of the future.

To provide a comprehensive overview of potential career opportunities within the EV sector, this report will categorize roles into five distinct domains. These categories will serve as groupings to identify and understand various pathways available in Windsor-Essex's burgeoning EV sector. Each category will be accompanied by an overview and definitions to facilitate a clearer understanding of the roles encompassed within them.

## The following are the five major categories:

- **Manufacturing**  
**EV Manufacturing** refers to the process of producing EVs on a large scale, involving the assembly of various components and subsystems to create a fully functional EV.
- **Maintenance**  
**EV Maintenance** refers to the regular upkeep, servicing, and repairs required to keep EVs in optimal operating condition.
- **Scientific Research**  
**EV Scientific Research** refers to the systematic investigation and study conducted by scientists, researchers and experts in various fields to advance the knowledge and understanding of EVs.
- **Design and Development**  
**EV Design and Development** refers to the process of creating and refining EVs.
- **Infrastructure**  
**EV Infrastructure** refers to the network of charging stations, support systems, and associated technologies that enable the charging and operation of EVs.

# Electric Vehicle Career Pathways

## Design and Development

EV design and development refers to the process of creating and refining EV. EV design involves various aspects, including the engineering and integration of electrical systems, battery technology, power electronics, drivetrain components, and overall vehicle architecture. It encompasses both the exterior and interior design elements of the vehicle, ensuring functionality, efficiency, safety, and aesthetics. EV design and development aims to create efficient, sustainable, and reliable EVs that are an alternative to traditional fossil-fuel powered transportation. It involves a multidisciplinary approach, bringing together engineering, design, materials science, and advanced technologies to shape the future of mobility.

**The following transitions to EV careers in design and development can be made by those with automotive knowledge and experience. Each of the below career pathways represents a classic manufacturing or an ICE-V production job transitioning (►) to multiple potential EV careers with transferable skillsets.**

# Electrical Technician – 2241 ► EV Powertrain Technician, Charging Infrastructure Specialist

## ICE-V Production Job Description

### Electrical Technicians:

- Electrical Technicians in the design and development stage of ICE-V production focus on creating and testing electrical systems that power vehicles. They help design and build electrical components, ensuring they work correctly, and contribute to making vehicles safer, more efficient, and advanced.



## Transferable Skills

- **EV Powertrain Technician:** Electrical systems troubleshooting, wiring and harnessing experience, component installation proficiency, electrical safety knowledge, diagnostic tool usage, vehicle testing familiarity, quality assurance awareness, collaboration and communication abilities, adaptability, mechanical aptitude, problem-solving skills, and an awareness of regulations and standards.
- **Charging Infrastructure Specialist:** Electrical systems installation and troubleshooting, wiring expertise, component integration knowledge, electrical safety awareness, diagnostic tool utilization, system testing familiarity, quality assurance experience, collaboration and communication abilities, adaptability, problem-solving skills, and an awareness of regulations and standards.

## Upskilling/Training

- **EV Powertrain Technician:** Electric powertrain components, high-voltage systems, battery maintenance, and electric motor diagnostics, while training in areas such as EV safety protocols, energy storage technologies, and charging infrastructure.
- **Charging Infrastructure Specialist:** EV charging technologies, electrical infrastructure design, energy management systems, and fast-charging solutions, while training in areas such as electric vehicle communication protocols, grid integration, and sustainable charging infrastructure planning.

## Educational Requirements

- **Electrical Technician (ICE-V):** Diploma in electrical engineering technology.
- **EV Powertrain Technician (EV):** Diploma in automotive technology or electrical engineering technology.

- **Charging Infrastructure Specialist (EV):** Bachelor's degree in electrical engineering, renewable energy, or related field



## EV Production Job Descriptions

### **Powertrain Technician:**

- Powertrain Technicians create the important parts that make EVs move. They use their skills to build, test, and improve the components that help the vehicle move. These technicians work on electric motors, batteries, and other systems that power the car.

### **Charging Infrastructure Specialist:**

- Charging Infrastructure Specialists focus on creating the places where EVs can be charged. They use their skills to design and plan charging stations and systems. These specialists work on finding solutions to make charging stations efficient, user-friendly, and widely available.

# Automotive Researcher/Analyst ➤ EV Product Planning Manager, EV Market Analyst

## ICE-V Production Job Description

### Automotive Researcher/Analyst:

- Automotive Researchers/Analysts in ICE-V production study and learn about cars and engines. They work on making cars better by finding new ideas and solutions. They look into engines, materials, and ways to make vehicles safer and more efficient. They also help create cars that are advanced and better for the environment.



## Transferable Skills

- EV Product Planning Manager: Market analysis, competitive research, trend identification, consumer insights, performance evaluation, vehicle testing familiarity, regulatory understanding, collaboration and communication abilities, adaptability, project management skills, cost analysis aptitude, problem-solving skills, and an aptitude for product planning.
- EV Market Analyst: Market analysis, competitive research, trend identification, consumer insights, performance evaluation, regulatory understanding, collaboration and communication abilities, adaptability, data interpretation skills, report generation proficiency, problem-solving skills, and an aptitude for assessing EV market trends.

## Upskilling/Training

- EV Product Planning Manager: Proficiency in electric powertrain technologies, battery systems, charging infrastructure, and market trends, while training in areas such as EV market analysis, consumer behavior, regulatory policies, and product lifecycle planning.
- EV Market Analyst: Electric vehicle market trends, consumer preferences, charging infrastructure, and regulatory policies, while training in areas such as battery technology advancements, EV adoption factors, and supply chain dynamics.

## Educational Requirements

- Automotive Researcher/Analyst (ICE-V): Bachelor's degree in automotive engineering, mechanical engineering, or related field.
- EV Product Planning Manager (EV): Bachelor's degree in business administration, marketing, automotive engineering, or related field.
- EV Market Analyst (EV): Bachelor's degree in business administration, economics, marketing, or related field.



## EV Production Job Descriptions

### **EV Product Planning Manager:**

- EV Product Planning Managers focus on creating and planning the features of EVs. They use their skills to decide what the vehicle should have, like the design, technology, and special features. These managers work with a team to make sure the electric car will be attractive and meet the needs of customers.

### **EV Market Analyst:**

- EV Market Analysts study and understand the market for EVs. They use their skills to analyze data and trends to predict what kind of electric vehicles people will want to buy. These analysts help the team make informed decisions about designing and developing electric cars that will be popular and successful.

# Powertrain Engineer – 2132 ► Electric Drivetrain Engineer, Battery Systems Engineer

## ICE-V Production Job Description

### Powertrain Engineer:

- Powertrain Engineers in ICE-V production focus on the engine and how a car moves. They work on creating and improving the engine and other parts that help move a car. These engineers use their knowledge to make sure engines work efficiently and smoothly.



## Transferable Skills

- **Electric Drivetrain Engineer:** Drivetrain design, transmission expertise, engine integration knowledge, performance optimization, emissions control familiarity, thermal management understanding, vehicle testing experience, collaboration and communication abilities, adaptability, control systems proficiency, problem-solving skills, and mechanical aptitude.
- **Battery Systems Engineer:** Drivetrain design, transmission expertise, engine integration knowledge, performance optimization, emissions control familiarity, thermal management understanding, vehicle testing experience, collaboration and communication abilities, adaptability, control systems proficiency, problem-solving skills, and mechanical aptitude.

## Upskilling/Training

- **Electric Drivetrain Engineer:** Electric powertrain design, motor technologies, battery integration, and power electronics, while training in areas such as electric motor control algorithms, regenerative braking systems, and thermal management strategies.
- **Battery Systems Engineer:** Battery chemistry, energy storage systems, thermal management strategies, and battery management systems, while training in areas such as battery safety, cell degradation mechanisms, and electric powertrain integration.

## Educational Requirements

- **Powertrain Engineer (ICE-V):** Bachelor's degree in mechanical engineering, automotive engineering, or related field.
- **Electric Drivetrain Engineer (EV):** Bachelor's degree in electrical engineering, automotive engineering, or related field.
- **Battery Systems Engineer (EV):** Bachelor's degree in electrical engineering, mechanical engineering or related field.





## EV Production Job Descriptions

### **Electric Drivetrain Engineer:**

- Electric Drivetrain Engineers focus on making the core parts that help EVs move. They use their skills to design and improve the components that power the vehicle, like the electric motors and transmission. These engineers work to ensure the drivetrain works efficiently and provides the right amount of power.

### **Battery Systems Engineer:**

- Battery Systems Engineers focus on making the batteries that power EVs work well. They use their skills to design and improve the entire battery system, including how the batteries are arranged and how they connect to the car. These engineers work to ensure the batteries are efficient, safe, and provide enough energy for the vehicle.

# Software Engineer – 2173 ➤ EV Software Developer, Charging Infrastructure Software Engineer

## ICE-V Production Job Description

### Software Engineer:

- Software Engineers in the design and development stage of ICE-V production work with computers to make cars smarter and more efficient. They create computer programs, like apps, that help control different parts of a vehicle. They design, test, and improve the programs that make vehicles work better.



## Transferable Skills

- **EV Software Developer:** Embedded software development, control systems programming, diagnostic tool utilization, communication protocol expertise, system integration knowledge, vehicle testing familiarity, collaboration and communication abilities, adaptability, software architecture design proficiency, problem-solving skills, and an understanding of automotive regulations and standards.
- **Charging Infrastructure Software Engineer:** Embedded software development, communication protocol expertise, system integration knowledge, diagnostic tool utilization, control systems programming, collaboration and communication abilities, adaptability, software architecture design proficiency, problem-solving skills, cybersecurity awareness, and an understanding of automotive regulations and standards.

## Upskilling/Training

- **EV Software Developer:** Electric powertrain control algorithms, battery management systems, charging protocols, and vehicle-to-grid communication, while training in areas such as electric motor control, energy management software, and EV-specific diagnostics.
- **Charging Infrastructure Software Engineer:** EV charging protocols, smart grid integration, energy management software, and real-time data analytics, while training in areas such as electric vehicle communication standards, fast-charging algorithms, and network security.

## Educational Requirements

- **Software Engineer (ICE-V):** Bachelor's degree in software engineering, computer science, or related field.
- **EV Software Developer (EV):** Bachelor's degree in computer science, software engineering, electrical engineering, or related field.

- **Charging Infrastructure Software Engineer (EV):** Bachelor's degree in computer science, software engineering, electrical engineering, or related field.



## EV Production Job Descriptions

### EV Software Developer:

- Software Developers create computer programs that help EVs work properly. They use their skills to write code that controls various aspects of the vehicle, like the display screen, sensors, and communication systems. These developers work to make sure the software runs smoothly and the car's technology functions correctly.

### Charging Infrastructure Software Engineer:

- Charging Infrastructure Software Engineers focus on creating computer programs for charging stations. They use their skills to write code that controls how the charging stations work. These engineers make sure the software enables efficient and safe charging for electric vehicles.