Aurora Mission Roadmap

**Entry Vehicle Demonstrator (EVD)** (2007)
- Primary Objectives:
  - Validate the robust design of a low-entry capsule.
  - Demonstrate high-speed low-entry technology.
  - Demonstrate that planetary protection measures can be implemented.
  - Validate operational aspects of sample return.

**Mars Sample Return – first launch (2011)**
- Scientific objectives:
  - Search for signs of life.
  - Perform geotechnical and meteorological analysis on samples of Martian soil.
  - Perform analysis of samples of Martian atmospheres.
  - Identify and characterize potential hazards for humans.
  - Evaluate and develop landing system technologies.
  - Minimize rover vehicle vibrations.
  - Sampling of atmospheres, top and deep soil.
  - Forward and backward planetary protection.
  - Operational aspects of a round trip to Mars.

**Human Mission Technologies Demonstrator(s) (2014)**
- Primary Objectives:
  - Demonstration assembly in orbit for planetary missions.
  - Demonstration of Life Support Systems in LOI.
  - Demonstration of Habitation aspects of Human Mars in LOI.
  - Demonstration of EVA aspects of Human Life Support in LO.
  - Demonstration of Vis-to-pretty characteristics in LO.
  - Demonstration of EVA aspects in induced gravity after prolonged crew exposure.
  - Demonstration of operational requirements.

**Human Moon Mission (2024)**
- Primary Objectives:
  - Demonstration of Life Support System.
  - Demonstration of Transfer Module for interplanetary trajectory.
  - Demonstration of EVA and Space DVA.
  - Demonstration of Soil-to-Earth.
  - Crew aspects following long-term isolation.
  - Fly performance aspects in induced gravity after protracted microgravity.
  - Demonstration of operational requirements.

**Cargo element of First Human Mission (2030)**
- Primary Objectives:
  - Land a crew on Mars for 2030 and return them safely, ensuring planetary protection for both Earth and Mars.
  - Demonstrate human capability to sustain human presence on Mars.
  - Perform exploration and expand scientific knowledge taking maximum advantage of human presence including sample selection.
  - Assess maintainability of planetary lag time human presence (likelihood, resources, readiness, engineering constraints).

**Entry Vehicle Demonstrator (EVD)**

**Mars Sample Return (MSR) – first launch**

**Human Mission Technologies Demonstrator(s)**

**Human Moon Mission**

**Cargo element of First Human Mission**

**Entry Vehicle Demonstrator (EVD)**

**Mars Sample Return (MSR) – second launch**

**Technological Pre-cursor Mission**

**Automatic Mars Mission (2026)**
- Primary Objectives:
  - Demonstration of In-Situ Propulsion for uncrewed soil vehicle.
  - Demonstration of Capture for a maneuvered soil vehicle.
  - Demonstration of EVA, descent and landing for an uncrewed soil vehicle.
  - Demonstration of Assumpted EVA for uncrewed soil vehicle.
  - Demonstrates of In-Situ Propulsion for uncrewed soil vehicle.
  - Demonstrates of EVA, descent and landing for uncrewed soil vehicle.

**First Human Mission to Mars**

**ExoMars (2009)**
- Scientific objectives:
  - Search for signs of life.
  - Perform geotechnical and meteorological analysis on samples of Martian soil.
  - Perform analysis of samples of Martian atmospheres.
  - Identify and characterize potential hazards for humans.
  - Evaluate and develop landing system technologies.
  - Minimize rover vehicle vibrations.
  - Sampling of atmospheres, top and deep soil.
  - Forward and backward planetary protection.
  - Operational aspects of a round trip to Mars.

**Mars Sample Return – second launch (2014)**

**Technological Pre-cursor Mission (2018)**

**Automatic Mars Mission (2026)**

**First Human Mission to Mars (2033)**
- Primary Objectives:
  - Land a crew on Mars by 2033 and return them safely, ensuring planetary protection for both Earth and Mars.
  - Demonstrate human capability to sustain human presence on Mars.
  - Perform exploration and expand scientific knowledge taking maximum advantage of human presence including sample selection.
  - Assess maintainability of planetary lag time human presence (likelihood, resources, readiness, engineering constraints).

**ExoMars**

**Mars Sample Return (MSR) – second launch**

**Technological Pre-cursor Mission**

**Automatic Mars Mission**

**First Human Mission to Mars (2033)**

**ExoMars**