Steps

Source Code Management: The development process starts with version control systems like Git to manage code changes. Developers commit their code regularly, ensuring traceability and easy rollbacks if needed.

Continuous Integration (CI):

Code Building & Testing: Upon code commit, the CI pipeline automatically triggers. It builds the code for the specific software update and runs automated tests (unit, integration) to verify functionality and identify potential bugs.

Static Code Analysis: Security checks and code quality analysis can also be integrated into the CI pipeline to detect vulnerabilities and ensure code maintainability.

Continuous Delivery/Deployment (CD):

Package & Stage: If tests pass in the CI stage, the code is packaged into an update file format suitable for the IoT devices. This package is then staged in a secure repository for further validation.

Validation & Release Management:

Functional & Regression Testing: A separate team performs comprehensive functional and regression testing on the staged update package. This ensures the update doesn't introduce unintended side effects or break existing functionalities.

Security Assessment: Security teams conduct vulnerability assessments to identify any potential security risks associated with the update.

Deployment & Monitoring:

OTA Server & Rollout Strategy: Once approved, the update package is uploaded to the manufacturer's OTA server. Deployment strategies can be phased, targeting specific vehicle models or regions first to minimize risk.

IoT devices Checks & Rollback: IoT devices connect to the OTA server periodically or upon user initiation. The device checks for compatibility with the update and available storage space. If everything aligns, the update is downloaded, installed, and followed by a verification process. Rollback options are available in case of critical issues.

Monitoring & Feedback: The entire update process is monitored for errors and user feedback is collected. This data helps identify issues and improve future OTA updates.