

Safety Plan Lane Assistance

**Document Version: [Version]**

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# Document history

**[Instructions: Fill in the date, version and description fields. You can fill out the Editor field with your name if you want to do so. Keep track of your editing as if this were a real world project.**

**For example, if this were your first draft or first submission, you might say version 1.0. If this is a second submission attempt, then you'd add a second line with a new date and version 2.0]**

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# Table of Contents

**[Instructions: We have provided a table of contents. If the table of contents is not showing up correctly in your word processor of choice, please update it. The table of contents should show each section of the document and page numbers or links. Most word processors can do this for you. In** [**Google Docs**](https://support.google.com/docs/answer/116338?co=GENIE.Platform%3DDesktop&hl=en)**, you can use headings for each section and then go to Insert > Table of Contents.** [**Microsoft Word**](https://support.microsoft.com/en-us/help/285059/how-to-create-a-table-of-contents-by-marking-text-in-word) **has similar capabilities]**

[Document history](#_1t3h5sf)

[Table of Contents](#_ktt3lgighckp)

[Introduction](#_zakt536q9xt3)

[Purpose of the Safety Plan](#_52ybytyytfvs)

[Scope of the Project](#_sh22j99mm02k)

[Deliverables of the Project](#_fzzlhwsfq6ys)

[Item Definition](#_t6m96u2v69wo)

[Goals and Measures](#_km1cu1hyl182)

[Goals](#_ww7fqc274i9y)

[Measures](#_v2rbrzjrkt9b)

[Safety Culture](#_b23s6orj91gm)

[Safety Lifecycle Tailoring](#_pqn9poe0nvtc)

[Roles](#_xlicd1ijavb7)

[Development Interface Agreement](#_swj0emygbhrm)

[Confirmation Measures](#_lllavvxrxrdy)

# Introduction

## Purpose of the Safety Plan

**[Instructions: Answer what is the purpose of a safety plan?]**

The main purpose if the safety plan is to provide an overall framework for lane assistance. A safety plan is required so as to define roles and then outline the steps that we will take to achieve functional safety

## Scope of the Project

**[Instructions: Nothing to do here. This is for your information.]**

For the lane assistance project, the following safety lifecycle phases are in scope:

Concept phase

Product Development at the System Level

Product Development at the Software Level

The following phases are out of scope:

Product Development at the Hardware Level

Production and Operation

## Deliverables of the Project

**[Instructions: Nothing to do here. This is for your information.]**

The deliverables of the project are:

Safety Plan

Hazard Analysis and Risk Assessment

Functional Safety Concept

Technical Safety Concept

Software Safety Requirements and Architecture

# Item Definition

**[Instructions:**

**REQUIRED**

**Discuss these key points about the system:**

**What is the item in question, and what does the item do?**

**The item in question here is the Lane Assistance System. The Lane Assistance System alerts the driver that the vehicle has gone off the road or is about to go off the road and tries to drive it back to the lane.**

**What are its two main functions? How do they work?**

**There are two main functions of the Lane Assistance System are listed as under:**

1. Lane departure warning
2. Lane keeping assistance

The lane departure warning function shall apply an oscillating steering torque to provide the driver a haptic feedback

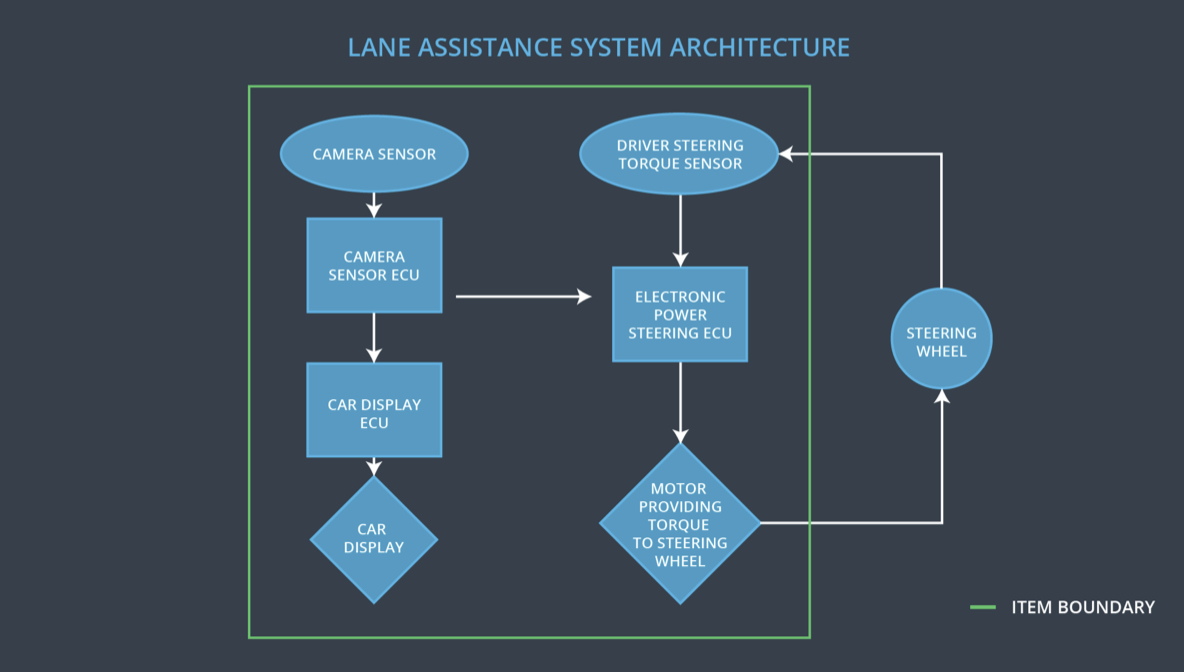
the lane keeping assistance function shall apply the steering torque when active in order to stay in ego lane". Ego lane refers to the lane in which the vehicle currently drives.

**Which subsystems are responsible for each function?**

**The subsystems that are responsible for each of the functions are the camera subsystem, electronic power steering system and the car display system.**

**What are the boundaries of the item? What subsystems are inside the item? What elements or subsystems are outside of the item?**

**The boundaries for item and the subsystems contained in the item can be aptly described by the image below. The image clearly marks the boundary of the item showing what is contained in the item and what is not contained in the item.**

****

**OPTIONAL**

**Optionally, include information about these points as well. These were not included in the lectures, but you might be able to find this information online:**

* **Operational and Environmental Constraints. This could especially be limited to camera performance; lane lines are difficult to detect in snow, fog, etc**
* **Legal requirements in your country for lane assistance technology**
* **National and International Standards Related to the Item**
* **Records of previously known safety-related incidents or behavioral shortfalls**

**]**

# Goals and Measures

## Goals

**[Instructions:**

**Describe the major goal of this project; what are we trying to accomplish by analyzing the lane assistance functions with ISO 26262?]**

**The main goal is to reduce the risk to the acceptable levels. By analyzing the lane assistance system, we are trying to accomplish the fact that the functions are working properly and would help us know the cause of the problem in the future, if there.**

## Measures

**[Instructions:**

**Fill in who will be responsible for each measure or activity. Hint: The lesson on Safety Management Roles and Responsibilities.**

**The options are:**

**All Team Members**

**Safety Manager**

**Project Manager**

**Safety Auditor**

**Safety Assessor**

**]**

|  |  |  |
| --- | --- | --- |
| Measures and Activities | Responsibility | Timeline |
| Follow safety processes | Safety Engineer | Constantly |
| Create and sustain a safety culture | Safety Manager | Constantly |
| Coordinate and document the planned safety activities | Safety Manager | Constantly |
| Allocate resources with adequate functional safety competency | Project Manger | Within 2 weeks of start of project |
| Tailor the safety lifecycle | Safety Manager | Within 4 weeks of start of project |
| Plan the safety activities of the safety lifecycle | Safety Manager | Within 4 weeks of start of project |
| Perform regular functional safety audits | Safety Auditor | Once every 2 months |
| Perform functional safety pre-assessment prior to audit by external functional safety assessor | Safety Manager | 3 months prior to main assessment |
| Perform functional safety assessment | Safety Assessor | Conclusion of functional safety activities |

# Safety Culture

**[Instructions:**

**Describe the characteristics of your company's safety culture. How do these characteristics help maintain your safety culture. Hint: See the lesson about Safety Culture**

**]**

**Some of the characteristics of a good safety culture are listed below:**

* **High priority**: safety has the highest priority among competing constraints like cost and productivity
* **Accountability**: processes ensure accountability such that design decisions are traceable back to the people and teams who made the decisions
* **Rewards**: the organization motivates and supports the achievement of functional safety
* **Penalties**: the organization penalizes shortcuts that jeopardize safety or quality
* **Independence**: teams who design and develop a product should be independent from the teams who audit the work
* **Well defined processes**: company design and management processes should be clearly defined
* **Resources**: projects have necessary resources including people with appropriate skills
* **Communication**: communication channels encourage disclosure of problems

**These characteristics help in maintaining the safety culture by following the right practices for keeping the safety as the first priority and even rewarding the people adequately who follow the culture.**

# Safety Lifecycle Tailoring

**[Instructions:**

**Describe which phases of the safety lifecycle are in scope and which are out of scope for this particular project. Hint: See the** [**Intro section**](#_sh22j99mm02k) **of this document**

**]**

# Roles

**[Instructions:**

**This section is here for your reference. You do not need to do anything here. It is provided to help with filling out the development interface agreement section.**

**]**

|  |  |
| --- | --- |
| Role | Org |
| Functional Safety Manager- Item Level | OEM |
| Functional Safety Engineer- Item Level | OEM |
| Project Manager - Item Level | OEM |
| Functional Safety Manager- Component Level | Tier-1 |
| Functional Safety Engineer- Component Level | Tier-1 |
| Functional Safety Auditor | OEM or external |
| Functional Safety Assessor | OEM or external |

# Development Interface Agreement

**[Instructions:**

**Assume in this project that you work for the tier-1 organization as described in the above roles table. You are taking on the role of both the functional safety manager and functional safety engineer.**

**Please answer the following questions:**

1. **What is the purpose of a development interface agreement?**
2. **What will be the responsibilities of your company versus the responsibilities of the OEM? Hint: In this project, the OEM is supplying a functioning lane assistance system. Your company needs to analyze and modify the various sub-systems from a functional safety viewpoint.**

**]**

# Confirmation Measures

**[Instructions:**

**Please answer the following questions:**

1. **What is the main purpose of confirmation measures?**
2. **What is a confirmation review?**
3. **What is a functional safety audit?**
4. **What is a functional safety assessment?**

**]**

A safety plan could have other sections that we are not including here. For example, a safety plan would probably contain a complete project schedule.

There might also be a "Supporting Process Management" section that would cover "Part 8: Supporting Processes" of the ISO 26262 functional safety standard. This would include descriptions of how the company handles requirements management, change management, configuration management, documentation management, and software tool usage and confidence.

Similarly, a confirmation measures section would go into more detail about how each confirmation will be carried out.