RDP FUNCTION SPECIFICATION
RDP 功能描述

Contents

History

Date	Author	Description	Version
21/11/2019	Zhongyan Bi Xiaohui Hu	Initial	1.0

Abbreviations

Abbreviations	Description
ABS	Anti-lock Braking System
ESP	Electrical Stability Program
EPS	Electrical Power Steering
RDP	Road Departure Protection
TCS	Traction Control System

1 Function Requirements 功能要求

1.1 Function Description 功能介绍

The RDP function prevents the driver from an unintended leaving of the road by applying a limited steering intervention that keeps the subject vehicle on its road and performs a road alignment.

RDP 通过施加有限的方向盘操纵以保持目标车辆在道路上行驶，从而阻止驾驶员驾驶车辆无意识偏离道路。

1.2 Function Conditions 状态迁移条件

1.2.1 Function Activation Condition 功能激活条件

The RDP function **Activation Condition** shall be fulfilled and the function shall become activated or shall stay activated, if **ALL** of the following conditions are fulfilled:

若满足以下所有条件，则满足功能激活条件：

1. The RDP function is coded.
   功能已被配置
2. The RDP function is switched ON.
   功能由驾驶员打开

1.2.2 Function De-Activation Condition 功能未激活条件

The RDP function **De-Activation Condition** shall be fulfilled and the function shall become de-activated or shall stay de-activated, if **AT LEAST ONE** of the following conditions are fulfilled:

若满足以下任意条件，则满足功能未激活条件：

1. The RDP function is NOT coded
   功能未被配置
2. The RDP function is NOT **switched** ON.
   功能未被打开

1.2.3 Function Availability Condition 功能可用条件

The Function Availability Condition is divided into side-independent and side-dependent (left/right) conditions.

功能可用状态分为与道路边界无关的和与道路边界有关（左/右）的可用条件

NOTE: Function Availability requires that the Function Activation Condition is fulfilled.

注意：功能可用需要满足功能激活条件

- If the Function Activation Condition is not fulfilled, the function can only be in function De-Activation state.

若功能激活条件未满足，则功能只能处于功能未激活状态

1.2.3.1 Side-Independent Availability Condition 与道路边界无关的可用条件

The RDP function **Side-Independent Availability Condition** shall be fulfilled and the function shall become available or stay available **side-independent**, if **ALL** of the following pre-conditions are fulfilled:

若满足以下所有条件，则满足与道路边界无关的可用条件

1. The function **Activation Condition** is fulfilled.
   功能激活条件满足
2. The ego-vehicle **speedometer velocity** is in the valid velocity range
   自车的速度表速度在有效的速度范围内
   (cRDP_VehicleSpeedMin_mps <= ClstrDspdVehSpd <= cRDP_VehicleSpeedMax_mps)
   If the velocity has been in the above valid velocity range before, the condition shall also use a hysteresis, which requires the velocity
   若速度之前已在有效的速度范围内，则该条件考虑滞后，并要求速度满足
   (cRDP_VehicleSpeedMin_mps - cRDP_VehicleSpeedMinHyst_mps <= ClstrDspdVehSpd <= cRDP_VehicleSpeedMax_mps + cRDP_VehicleSpeedMaxHyst_mps)
3. The ego-vehicle's **hazard lights** is NOT activated.
   警示灯未被激活
4. The ego-vehicle is **driving forward**.
   自车向前行驶
5. The ego-vehicle longitudinal acceleration is less than the threshold
   自车的纵向加速度小于阈值 cRDP_VehLongAccelerationThTrigger_mpss
6. The ego-vehicle longitudinal deceleration is less than the threshold
   自车的纵向减速度小于阈值 cRDP_VehLongDecelerationThTrigger_mpss
7. The ego-vehicle **absolute lateral acceleration** is less than the threshold
   自车的横向加速度的绝对值小于阈值 cRDP_VehLatAccelerationThTrigger_mpss
8. The **ABS** function is NOT deactivated and is available.
   ABS 可用
9. The **ABS** function is NOT performing an intervention.
   ABS 没有进行干预
10. The **ESC** function is NOT deactivated and is available.
    ESC 可用
11. The **ESC** function is NOT performing an intervention.
    ESC 没有进行干预
12. The **TSC** function is NOT deactivated and is available.
    TSC 可用
13. The **TSC** function is NOT performing an intervention.
    TSC 没有进行干预

14. The Driver hands on.
    驾驶员未脱手

1.2.3.2 *Side-Dependent Availability Condition 与道路边界有关的可用条件*

The RDP function **Side-Dependent Availability Condition** shall be fulfilled and the function shall become available or stay available for a **certain side** (**left** or **right**), if **ALL** of the following pre-conditions are fulfilled:

若满足以下所有条件，则满足某一边（左/右）与道路边界有关的可用条件：

1. The **road edge** is **available** on the **certain side** (left/right)
   某一边（左/右）的道路边界可用
2. In case of only a **road edge** is available on a **certain side** (left/right), the road edge on the certain side has to be **steady** and shall not show unsteady characteristics.
   若某一边（左/右）仅有道路边界可用，则该识别出的边界需稳定且可靠
3. The **available road edge** does not need to be steady in case of a **lane marking** is available close to the available **road edge** on a **certain side** (left/right). In this case, the **lane marking** has to be **steady** and needs not to show unsteady characteristics.
   若某一边（左/右）靠近可用道路边界的车道线可用，则该可用的道路边界无需稳定，但该识别出的车道线需稳定且可靠
4. The ego-vehicle **turn indicator** is NOT activated.
   自车的转向指示灯未被激活

1.2.4 Function Un-Availability Condition 功能不可用条件

The Function Un-Availability Condition is divided into side-independent and side-dependent (left/right) conditions.

功能不可用条件分为与道路边界无关的和与道路边界有关的不可用条件

NOTE: Function Un-Availability requires that the function Activation Condition is fulfilled.

注意：功能不可用需要满足功能激活条件

- If the function Activation Condition is not fulfilled, the function can neither be in function Available or Un-Available state but only in function De-Activation state.

若功能激活条件未满足，则功能只能处于功能未激活状态

1.2.4.1 *Side-Independent Un-Availability Condition 与道路边界无关的不可用条件*

The RDP function **Side-Independent Un-Availability Condition** shall be fulfilled and the function shall become un-available or stay un-available **side-independent**, if **AT LEAST ONE** of the following conditions is fulfilled:

若满足以下任一条件，则满足与道路边界无关的不可用条件

1. The ego-vehicle **speedometer velocity** is not in the valid velocity range considering a hysteresis. This is the case, if the ego-vehicle velocity is below (**cRDP_VehicleSpeedMin_mps** - **cRDP_VehicleSpeedMinHyst_mps**) or above (**cRDP_VehicleSpeedMax_mps** + **cRDP_VehicleSpeedMaxHyst_mps**).
   考虑滞后，自车的速度未在有效的速度范围内 。即速度小于 (cRDP_VehicleSpeedMin_mps - cRDP_VehicleSpeedMinHyst_mps)，或大于 (cRDP_VehicleSpeedMax_mps + cRDP_VehicleSpeedMaxHyst_mps)
2. The ego-vehicle's **hazard lights** is activated.
   警示灯被激活
3. The ego-vehicle is NOT **driving forward**.
   自车非向前行驶
4. The ego-vehicle longitudinal acceleration is bigger than the threshold
   自车的纵向加速度大于阈值 cRDP_VehLongAccelerationThTrigger_mpss+ cRDP_VehLongAccelerationThHyst_mpss
5. The ego-vehicle longitudinal decceleration is bigger than the threshold
   自车的纵向减速度大于阈值 cRDP_VehLongDecelerationThTrigger_mpss+ cRDP_VehLongDecelerationThHyst_mpss
6. The ego-vehicle **absolute lateral acceleration** is bigger than the threshold
   自车的横向加速度的绝对值大于阈值 cRDP_VehLatAccelerationThTrigger_mpss+ cRDP_VehLatAccelerationThTriggerHyst_mpss
7. The **ABS** function is deactivated or is NOT available.
   ABS 不可用
8. The **ABS** function is performing an intervention.
   ABS 正在进行干预
9. The **ESC** function is deactivated or is NOT available.
   ESC 不可用
10. The **ESC** function is performing an intervention.
    ESC 正在进行干预
11. The **TSC** function is deactivated or is NOT available.
    TCS 不可用
12. The **TSC** function is performing an intervention.
    TCS 正在进行干预
13. The driver hands off.
    驾驶员脱手

1.2.4.2 Side-Dependent Un-Availability Condition 与道路边界有关的不可用条件

The RDP function **Side-Dependent Un-Availability Condition** shall be fulfilled and the function shall become un-available or stay un-available for a **certain side** (**left** or **right**), if **AT LEAST ONE** of the following condition is fulfilled:

若满足以下任一条件，则满足某一边（左/右）的与道路边界有关的不可用条件

1. No relevant **road edge** is **available** on the **certain side** (left/right).
   不存在可用的道路边界

2. The ego-vehicle **turn indicator** is activated into the direction of the certain side.
   自车的转向指示灯被激活
3. No **road edge** or **combination of road edge and lane marking** is available, which fulfill the availability and steadiness criteria.
   无可用的道路边界，或车道线与道路边界的组合

1.2.5 Function Control-Start Condition 功能控制开启条件

The RDP function **Control-Start Condition** shall be fulfilled and the function shall only be allowed to start lateral control respecting a certain side (left/right), if **ALL** of the following conditions are fulfilled:

若满足以下所有条件，则满足某一边的功能控制开启条件

1. The function **Side-Independent Availability Condition** is fulfilled
   满足与道路边界无关的可用条件
2. The function **Side-Dependent Availability Condition** is fulfilled for a certain side (left/right), for which the control is started.
   满足某一边的与道路边界有关的可用条件
3. The conditions of at least one **relevant use-case** are fulfilled for a certain side (left/right). Relevant use-cases are: **Departure Protection - Road Departure**
   满足某一边的相关用例的条件。相关用例是：偏离保护-道路偏离
4. The **blocking time** of **cRDP_InterventionBlockingTime_sec** has been passed since the last RDP control has been stopped.
   与上一 RDP 控制的间隔时间大于 cRDP_InterventionBlockingTime_sec

1.2.6 Function Control-Finish Condition 功能控制结束条件

The RDP function **Control-Finish Condition** shall be fulfilled and the function shall only be allowed to finish lateral control respecting a certain side (left/right), if **ALL** of the following conditions are fulfilled:

若满足以下所有条件，则满足某一边的功能控制结束条件

1. The function **Side-Independent Availability Condition** is fulfilled.
   满足与道路边界无关的可用条件
2. The function **Side-Dependent Availability Condition** is fulfilled for the certain side, for which the control was started (left/right).
   满足某一边的与道路边界有关的可用条件
3. The **lateral control target has been reached.**
   达到横向控制目标
4. The **lateral control time** is smaller or equal the maximum control time.
   横向控制时间未超过最大控制时间

1.2.7 Function Control-Cancel Condition 功能控制取消条件

The RDP function **Control-Cancel Condition** shall only be fulfilled and the function shall only be allowed to cancel lateral control respecting a certain side (left/right), if **AT LEAST ONE** of the following conditions is fulfilled:

若满足以下任一条件，则满足功能控制取消条件

1. The function **De-Activation Condition** is fulfilled.
   满足功能未激活条件
2. The function **Side-Independent Un-Availability Condition** is fulfilled.
   满足与道路边界无关的不可用条件
3. The function **Side-Dependent Un-Availability Condition** is fulfilled for the certain side, for **which the lateral control was initiated**.
   满足某一边的与道路边界有关的不可用条件
4. The **driver overrides** the lateral intervention into the **opposite direction** of the hazardous road edge.
   驾驶员主动干预，驾驶车辆驶离危险道路边界
5. The **driver overrides** the lateral intervention into the **same direction** of the hazardous road edge.
   驾驶员主动干预，驾驶车辆驶向危险道路边界
6. The **lateral control time** is bigger as the maximum control time.
   横向控制时间超过最大控制时间
7. The ego-vehicle **overrides** the **hazardous road edge** with the outside of the ego-vehicle front wheel by more than 0.5 meter.
   自车前轮越过危险道路边界 0.5 米
8. The ego-vehicle **overshoots** into direction of a potentially available **lane marking on the opposite side during lateral control** and shows probability to cross the lane marking on the **opposite side**.
   自车有超调的可能

1.2.8 Function Error Condition 功能错误条件

The RDP **Function Error Condition** shall only be fulfilled and the function shall show an error, if **AT LEAST ONE** of the following conditions is fulfilled:

若满足以下任一条件，则满足功能错误条件

1. The **error handling** of the RDP function detected an error, which requires the RDP function to immediately switch off the function.
   RDP 的错误处理检测到错误，需要立即关闭该功能
   NOTE: Relevant errors are
   注意：相关的错误是
   1. Mandatory input signal quality failure
      必须的输入信号质量故障
   2. Mandatory input signal communication failure.
      必须的输入信号通信故障

1.3 Function States 功能状态

The RDP function realizes the following states:

RDP 功能实现以下状态：

1. De-Activated State
   未激活状态
2. (Activated and) Un-Available State
   （激活）不可用状态
3. (Activated and) Available Both Sides State
   （激活）双边可用状态
4. (Activated and) Available One Side State
   （激活）单边可用状态
5. (Activated, Available and) Controlling State
   （激活，可用）控制状态
6. Stopping Control State
   停止控制状态
7. (Activated and) Error State
   （激活）错误状态

1.3.1 Function De-Activated State 未激活状态

1.3.1.1 Conditions 条件

The RDP function shall be in the **Function De-Activated State**, if the **Function De-Activation Condition** is fulfilled.

若满足功能未激活条件，则 RDP 处于未激活状态

1.3.1.2 Function Behavior 功能行为

If the RDP function is in the **Function De-Activated State**, it shall realize the following behavior:

若功能处于未激活状态，则需要实现以下行为

1. The RDP function shall show on ego-vehicle **HMI** level that it is **de-activated**.
   RDP 功能需在 HMI 上显示未开启
2. The RDP function shall NOT request any lateral control.
   RDP 功能不应请求横向控制

1.3.2 Function Un-Available State 不可用状态

1.3.2.1 Conditions 条件

IF the **Side-Independent Un-Availability Condition** is fulfilled. **AND IF** the **Side-Dependent Availability Condition** is NOT fulfilled for both sides (left and right).

若满足功能与道路边界无关的不可用条件，且不满足两边的与道路边界有关的可用条件，则 RDP 处于不可用状态

1.3.2.2 Function Behavior 功能行为

If the RDP function is in the **Function Un-Available State**, it shall realize the following behavior:

若功能处于不可用状态，则需要实现以下行为

1. The RDP function shall show on ego-vehicle **HMI** level that it is **activated**, but **not available** for lateral control support.
   RDP 功能需在 HMI 上显示开启，但横向控制支持不可用
2. The RDP function shall NOT request any lateral control.
   RDP 功能不应请求横向控制

1.3.3 Function Available Both Sides State 双边可用状态

1.3.3.1 Conditions 条件

The RDP function shall be in the **Function Available Both Sides State**, **IF** the **Side-Independent Availability Condition** is fulfilled **AND IF** the **Side-Dependent Availability Condition** is fulfilled for both sides (left and right).

若满足功能与车道边界无关的可用条件，且满足两边的与车道边界有关的可用条件，则 RDP 处于双边可用状态

1.3.3.2 Function Behavior 功能行为

If the RDP function is in the **Function Available Both Sides State**, it shall realize the following behavior:

若功能处于双边可用状态，则需要实现以下行为：

1. The RDP function shall show on ego-vehicle **HMI** level that it is **activated** and **available** for lateral control support **on both sides** (left and right).
   RDP 功能需在 HMI 上显示开启和双边的横向控制可用
2. The RDP function shall **NOT** request any lateral control, as long as the ego-vehicle is **NOT** under a function **use-case condition** for starting a lateral control.
   当自车不符合用例条件，RDP 功能不应请求任何横向控制
3. The RDP function shall **initiate lateral control** for a certain side (left or right) into counter-direction of road departure, as soon as the **Function Control-Start Condition** is fulfilled.
   一旦功能控制开启条件满足，RDP 功能需开启横向控制功能

1.3.4 Function Available One Side State 单边可用状态

1.3.4.1 Conditions 条件

The RDP function shall be in the **Function Available One Side State**, **IF** the **Side-Independent Availability Condition** is fulfilled **AND IF** the **Side-Dependent Availability Condition** is fulfilled **only** for **one** side (left XOR right).

若满足与道路边界无关的可用条件，且仅满足某一边的与道路边界有关的可用条件，则 RDP 处于单边可用状态

1.3.4.2 Function Behavior 功能行为

If the RDP function is in the **Function Available One Side State**, it shall realize the following behavior:
若功能处于单边可用状态，则需要实现以下行为：

1. The RDP function shall show on ego-vehicle **HMI** level that it is **activated** and **available** for lateral control support only for the **certain side** (left XOR right), for which the **Side-Dependent Availability Condition** is fulfilled.
   RDP 功能需在 HMI 上显示开启和满足和道路边界有关的可用条件的那一边的横向控制可用
2. The RDP function shall **NOT** request any lateral control, as long as the ego-vehicle is **NOT** under a function **use-case condition** for starting a lateral control.
   当自车不符合用例条件，RDP 功能不应请求任何横向控制
3. The RDP function shall **initiate lateral control** into counter-direction of lane departure for the **certain side** (left XOR right), for which it shows availability, as soon as the **Function Control-Start Condition** from is fulfilled for the **certain side**.
   一旦某一边的功能控制开启条件满足，RDP 功能需开启横向控制功能

1.3.5 Function Controlling State 功能控制状态

1.3.5.1 Conditions 条件

The RDP function shall be in the **Function Controlling State**,

IF the **Function Control-Start Condition** was fulfilled for one certain side for at least one point in time

AND IF the **Function Control-Finish Condition** is NOT fulfilled

AND IF the **Function Control-Cancel Condition** is NOT fulfilled.

若满足某一边的功能控制开启条件，

且不满足功能控制结束条件，

且不满足功能控制取消条件，

则 RDP 处于功能控制状态

1.3.5.2 Function Behavior 功能行为

If the RDP function is in the **Function Controlling State**, it shall realize the following behavior:

若功能处于控制状态，则需要实现以下行为：

1. The RDP function shall show on ego-vehicle **HMI** level that it is **activated** and that it is **performing lateral control** for the **certain side** (left XOR right), for which the lateral control was started.
   RDP 功能需在 HMI 上显示开启和正在进行横向控制
2. The RDP function shall provide **lateral control** in **counter-direction** of the lane departure so that the **lane departure is prevented**.

RDP 功能需提供与道路偏离方向相反的横向控制，以阻止道路偏离

3. The RDP function **lateral control** shall **align** the ego-vehicle **in parallel** to the road edge (respectively the joint lane marking), for which the lateral control was started, after the road departure has been prevented and the lateral distance between the ego-vehicle and the road edge is safe again.
   当道路偏离已经被阻止，且自车与道路边界的距离已达到安全距离，RDP 功能需使自车与道路边界平行
4. The RDP function **lateral control** shall **not overshoot** into counter-direction of prevented road departure in a way that the ego-vehicle comes close to a lane marking on the opposite side.
   RDP 功能的横向控制不应过度，使得自车靠近车道偏离相反的一边

1.3.6 Function Stopping Control State 功能停止控制状态

1.3.6.1 Conditions 条件

The RDP function shall be in the **Function Stopping Control State**,

IF the function was in **Function Controlling State**

AND (

IF the **Function Control-Finish Condition** was fulfilled

OR IF the **Function Control-Cancel Condition** was fulfilled

)

若功能过去处于功能控制状态，且

（满足功能控制结束条件，

或满足功能控制取消条件），则 RDP 处于功能停止控制状态

1.3.6.2 Function Behavior 功能行为

Finish Condition:

结束条件：

1. RDP function shall ramp out the lateral intervention via a **comfortable steering intervention rampout**.
   RDP 功能应通过舒适的操纵干预退出以结束横向干预

Cancel Condition:

取消条件：

1. RDP function shall ramp out the lateral intervention via a **quick but comfortable steering intervention rampout**.
   RDP 功能应通过快速且舒适的操纵干预退出以取消横向干预

1.3.7 Function Error State 功能错误状态

1.3.7.1 Conditions 条件

The RDP function shall be in the **Function Error State**, **IF** the **Function Error Condition** is fulfilled.

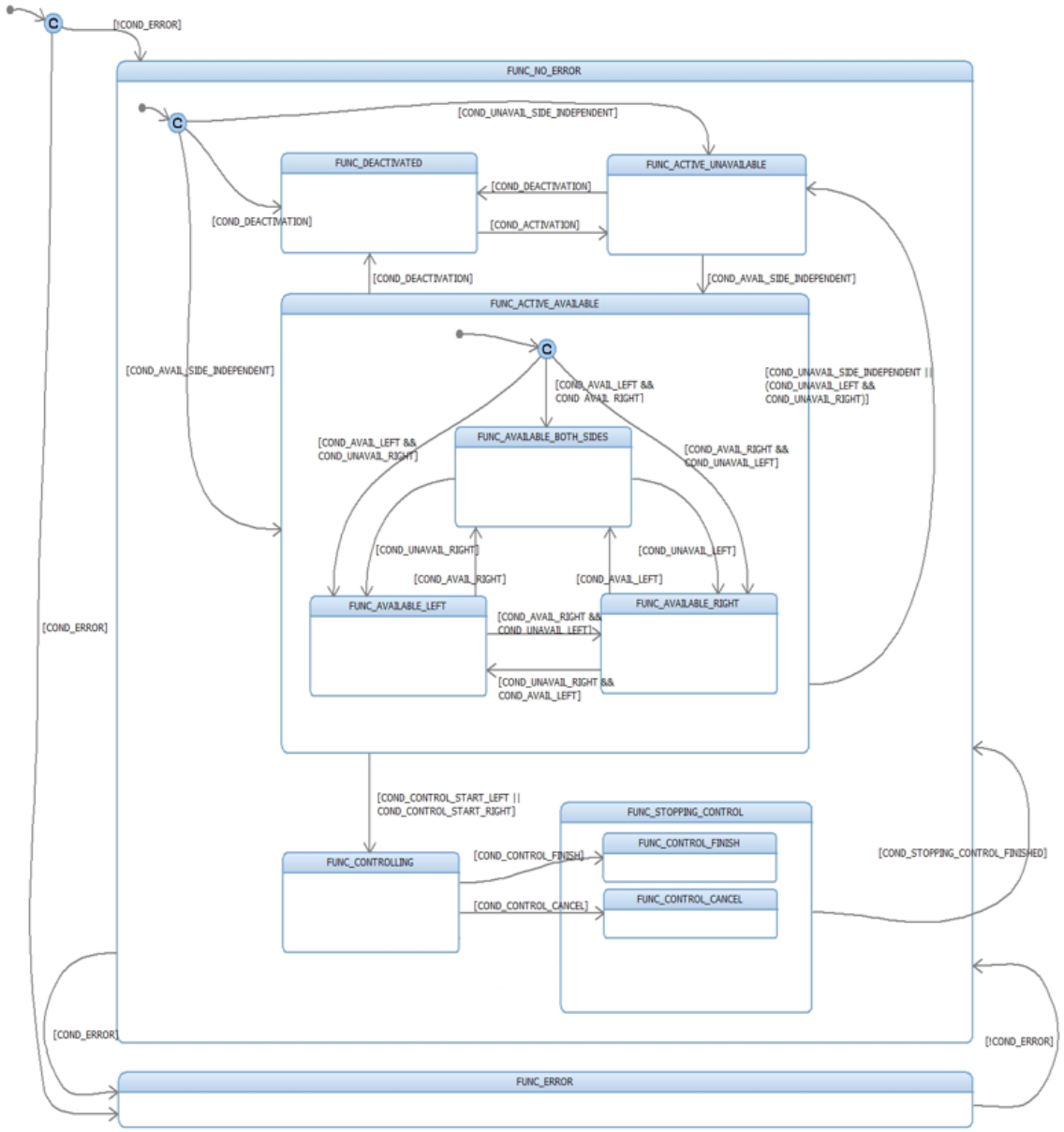
若满足功能错误条件，则 RDP 处于功能错误状态

1.3.7.2 Function Behavior 功能行为

If the RDP function is in the **Function Error State**, it shall realize the following behavior:
若功能处于错误状态，则需要实现以下行为：

1. The RDP function shall NOT request any lateral control.
   RDP 功能不应请求任何横向控制
2. RDP function shall ramp out an ongoing lateral control via a **less comfortable, but quick and safe steering intervention rampout**, which fulfills the **Lateral Control Request Abort Behavior** requirements.
   RDP 功能应通过舒适性略低，但快速且安全但的操纵干预退出以退出正在进行的横向控制

1.3.8 Function State Chart 功能状态图



Current State	Target State	Conditions	CAN signals Involved(Suggested)
RDP_DEACTIVATED 功能未激活状态	RDP_ACTIVE_UNAVAILABLE 功能不可用状态	COND_ACTIVATION 功能激活条件 COND_UNAVAIL 功能不可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_ERROR 功能错误状态	COND_ERROR 功能错误条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
RDP_ACTIVE_UNAVAILABLE 功能不可用状态	RDP_AVAILABLE_BOTH_SIDES 功能双边可用状态	COND_AVAIL_SIDE_INDEPEDENT 功能与边无关的可用条件 且 COND_AVAIL_LEFT 与左侧边有关的可用条件 且 COND_AVAIL_RIGHT 与右侧边有关的可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_AVAILABLE_LEFT 功能左侧边可用状态	COND_AVAIL_SIDE_INDEPEDENT 功能与边无关的可用条件 且 COND_AVAIL_LEFT 与左侧边有关的可用条件 且 COND_UNAVAIL_RIGHT 与右侧边有关的不可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_AVAILABLE_RIGHT 功能右侧边可用状态	COND_AVAIL_SIDE_INDEPEDENT 功能与边无关的可用条件 且 COND_UNAVAIL_LEFT 与左侧边有关的不可用条件 且 COND_AVAIL_RIGHT 与右侧边有关的可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_ERROR 功能错误状态	COND_ERROR 功能错误条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_DEACTIVATED 功能未激活状态	COND_DEACTIVATION 功能未激活条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
RDP_AVAILABLE_BOTH_SIDES 功能双边可用状态	RDP_AVAILABLE_LEFT 功能左侧边可用状态	COND_UNAVAIL_RIGHT 功能右侧边不可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved

	RDP_AVAILABLE_RIGHT 功能右侧边可用状态	COND_UNAVAIL_LEFT 功能左侧边不可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_CONTROLLING 功能控制状态	COND_CTRLSTRT_LEFT 功能左侧边控制开启条件 或 COND_CTRLSTRT_RIGHT 功能右侧边控开启条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_ACTIVE_UNAVAILABLE 功能不可用状态	COND_UNAVAIL_SIDE_INDEPENDENT 功能与边无关的不可用条件 或 (COND_UNAVAIL_RIGHT 与左侧边有关的不可用条件 且 COND_UNAVAIL_LEFT 与右侧边有关的不可用条件)	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_ERROR 功能错误状态	COND_ERROR 功能错误条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_DEACTIVATED 功能未激活状态	COND_DEACTIVATION 功能未激活条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
RDP_AVAILABLE_LEFT 功能左侧边可用状态	RDP_AVAILABLE_BOTH_SIDES 功能双边可用状态	COND_AVAIL_RIGHT 功能右侧边可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_AVAILABLE_RIGHT 功能右侧边可用状态	COND_UNAVAIL_LEFT 功能左侧边不可用条件 且 COND_AVAIL_RIGHT 功能右侧边可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_CONTROLLING 功能控制状态	COND_CTRLSTRT_LEFT 功能左侧边控制开启条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_ACTIVE_UNAVAILABLE 功能不可用状态	COND_UNAVAIL_SIDE_INDEPENDENT 功能与边无关的不可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable

		或 (COND_UNAVAIL_RIGHT 与左侧边有关的不可用条件 且 COND_UNAVAIL_LEFT 与右侧边有关的不可用条件)	0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_ERROR 功能错误状态	COND_ERROR 功能错误条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_DEACTIVATED 功能未激活状态	COND_DEACTIVATION 功能未激活条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
RDP_AVAILABLE_RIGHT 功能右侧边可用状态	RDP_AVAILABLE_BOTH_SIDES 功能双边可用状态	COND_AVAIL_LEFT 功能左侧边可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_AVAILABLE_LEFT 功能左侧边可用状态	COND_UNAVAIL_RIGHT 功能右侧边不可用条件 且 COND_AVAIL_LEFT 且功能左侧边可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_CONTROLLING 功能控制状态	COND_CTRLSTRT_RIGHT 功能右侧边控开启条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_ACTIVE_UNAVAILABLE 功能不可用状态	COND_UNAVAIL_SIDE_INDEPENDENT 功能与边无关的不可用条件 或 (COND_UNAVAIL_RIGHT 与左侧边有关的不可用条件 且 COND_UNAVAIL_LEFT 与右侧边有关的不可用条件)	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_ERROR 功能错误状态	COND_ERROR 功能错误条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_DEACTIVATED 功能未激活状态	COND_DEACTIVATION 功能未激活条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout

			0x5=Error 0x6~0x7=reserved
RDP_CONTROLLING 功能控制状态	RDP_CONTROL_FINISH 功能控制结束状态	COND_CTRLFNSH 功能控制结束条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_CONTROL_CANCEL 功能控制取消状态	COND_CTRLCNCL 功能控制取消条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_ERROR 功能错误状态	COND_ERROR 功能错误条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
RDP_CONTROL_FINISH 功能控制结束状态	RDP_ACTIVE_AVAILABLE 功能可用状态	COND_AVAIL 功能可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
RDP_CONTROL_CANCEL 功能控制取消状态	RDP_ACTIVE_AVAILABLE 功能可用状态	COND_AVAIL 功能可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
	RDP_ACTIVE_UNAVAILABLE 功能不可用状态	COND_UNAVAIL 功能不可用条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved
RDP_ERROR 功能错误状态	RDP_NO_ERROR 功能无错误状态	! COND_ERROR 功能错误条件	RDPSysSts: 0x0=Off 0x1=Available 0x2=Unavailable 0x3=Control 0x4=Rampout 0x5=Error 0x6~0x7=reserved

1.4 Function Use-Cases 功能用例

1.4.1 Departure Protection - Road Departure 偏离保护-道路偏离

The RDP function **Departure Protection - Road Departure** use-case is the function use-case, which motivated the RDP function development. The use-case addresses the departure

prevention to keep the ego-vehicle on the road surface, when it unintentionally approaches the edge of the ego-vehicle road.

该用例处理偏离保护，以使自车保持在道路上行驶，当它无意识接近自车车道边界时

1.4.1.1 General Behavior 行为

The RDP function shall realize the following behavior when addressing the **Departure Protection - Road Departure** use-case:

当 RDP 功能在处理偏离保护-道路偏离时，需实现以下行为：

1. In case of a road edge approach of the ego-vehicle, the RDP function shall start the lateral control in counter-direction of an expected road departure.
   The lateral control shall start at sufficient distance to an approached road edge, in order to prevent the ego-vehicle from departing the road.
   当自车接近道路边界，RDP 功能需开始与道路偏离方向相反的横向控制
   为了阻止自车偏离道路，横向控制功能须在与所接近的道路边界的一定距离开启
2. The RDP function shall stop the lateral control in case of prevented road departure regulary, when the road departure was prevented and the ego-vehicle was aligned in parallel to priorly approached road edge.
   当道路偏离已经被阻止，且自车与之前接近的道路边界平行对齐时，则 RDP 功能应停止横向控制
3. The RDP function shall achieve to prevent the lane departure and to stop the lateral control regulary, within a maximum time frame of **cRDP_InterventionCancelControlTimeMax_sec**.
   RDP 功能需在 cRDP_InterventionCancelControlTimeMax_sec 时间内完成阻止道路偏离并停止横向控制
4. If the RDP function does not achieve to prevent the lane departure within the time frame of **cRDP_InterventionCancelControlTimeMax_sec**, the lateral intervention shall be stopped.
   若 RDP 功能未在 cRDP_InterventionCancelControlTimeMax_sec 时间内完成阻止道路偏离，则横向干预需被停止

1.4.1.2 Scenario 1: Departure Protection for Road Edges - Straight Road Departure
场景 1：道路边界的偏离保护-直道偏离

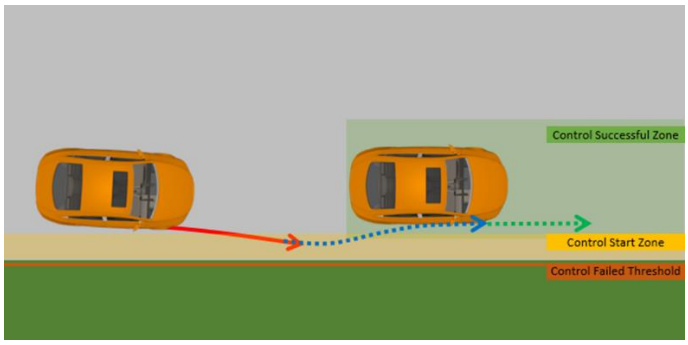
1.4.1.2.1 Scenario 场景

Departure Protection for Road Edges - Straight Road Departure describes the basic scenario for the RDP function, for which the RDP function shall prevent the ego-vehicle from unintended road departure. The certain characteristic of this scenario is that the **ego-lane** is a **straight road**. The scenario is divided into characteristic sub-scenarios, which have **differences** in their **availability** of ego-lane **lane markings**.

该场景为 RDP 功能的基本场景。自车车道为直道是该场景的特征。针对不同的自车车道线可用情况，该场景又被分为以下几个子场景。

1.4.1.2.2 Sub-Scenario 1.1: Departure Protection for Road Edge Only and Centre Lane Marking un-available

子场景 1.1：仅有道路边界且无车道中心线

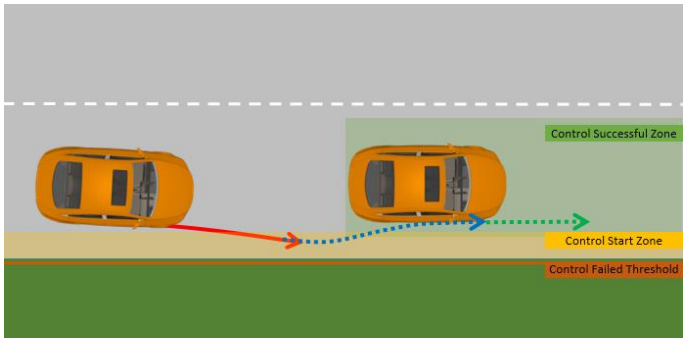


1.4.1.2.2.1 Characteristic Conditions 特征条件

1. The **Departure Protection for Road Edge Only and Centre Lane Marking un-available** sub-scenario shall be relevant for **straight roads** only.
   车道为直道
2. The **Departure Protection for Road Edge Only and Centre Lane Marking un-available** sub-scenario shall be relevant, if the ego-vehicle approaches a road edge either on its **left** or **right side**.
   自车的左前轮或右前轮接近道路边界
3. The **Departure Protection for Road Edge Only and Centre Lane Marking un-available** sub-scenario shall only be relevant, if the ego-vehicle **ego-lane** is not marked by a recognizable lane marking on the road edge **departure side** and is not marked by a recognizable lane marking on the **non-departure side**.
   自车车道的道路偏离与非偏离侧没有可识别的车道线

1.4.1.2.3 Sub-Scenario 1.2: Departure Protection for Road Edge Only and Centre Lane Marking available

子场景 1.2：仅有道路边界且有车道中心线



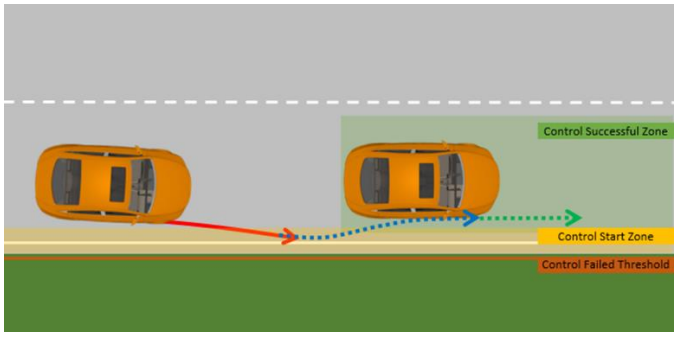
1.4.1.2.3.1 Characteristic Conditions 特征条件

1. The **Departure Protection for Road Edge Only and Centre Lane Marking available** sub-scenario shall be relevant for **straight roads** only.
   车道为直道

2. The **Departure Protection for Road Edge Only and Centre Lane Marking available** sub-scenario shall be relevant, if the ego-vehicle approaches a road edge either on its **left** or **right side**.
   自车的左前轮或右前轮接近道路边界
3. The **Departure Protection for Road Edge Only and Centre Lane Marking available** sub-scenario shall only be relevant, if the ego-vehicle **ego-lane** is not marked by a recognizable lane marking on the road edge **departure side** and is marked by a recognizable lane marking on the **non-departure side**.
   自车车道的道路偏离侧没有可识别的车道线，而非道路偏离侧有可识别的车道线

1.4.1.2.4 Sub-Scenario 1.3: Departure Protection for Road Edge with Lane marking and Centre Lane Marking available

子场景 1.3：有车道线的道路边界且有车道中心线

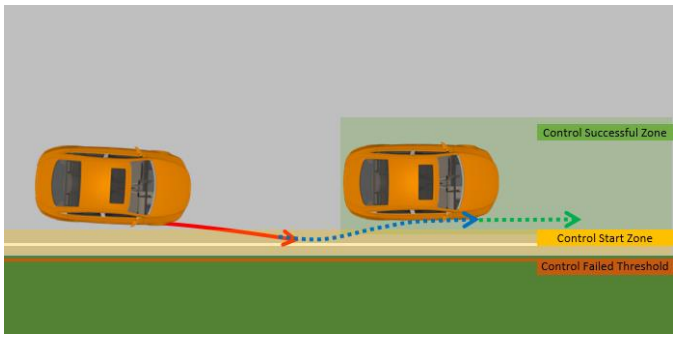


1.4.1.2.4.1 Characteristic Conditions 特征条件

1. The **Departure Protection for Road Edge with Lane marking and Centre Lane Marking available** sub-scenario shall be relevant for **straight roads** only.
   车道为直道
2. The **Departure Protection for Road Edge with Lane marking and Centre Lane Marking available** sub-scenario shall be relevant, if the ego-vehicle approaches a road edge either on its **left** or **right side**.
   自车的左前轮或右前轮道路边界
3. The **Departure Protection for Road Edge with Lane marking and Centre Lane Marking available** sub-scenario shall only be relevant, if the ego-vehicle **ego-lane** is marked by a recognizable lane marking on the road edge **departure side** and is marked by a recognizable lane marking on the **non-departure side**.
   自车车道的道路偏离侧有可识别的车道线，且非道路偏离侧有可识别的车道线
4. The **Departure Protection for Road Edge with Lane marking and Centre Lane Marking available** sub-scenario shall only be relevant, if the lateral distance between the approached road edge and the inner edge of the neighbored lane marking is below **cRDP_LaneMarkingRoadEdgeDistMax_met**. Also, the considered lane marking needs to be closer to the ego-vehicle than the approached road edge.
   所接近的道路边界与临近车道线内侧的横向距离需小于 cRDP_LaneMarkingRoadEdgeDistMax_met。此外，该车道线比道路边界更靠近自车。

1.4.1.2.5 Sub-Scenario 1.4: Departure Protection for Road Edge with Lane marking and Centre Lane Marking un-available

子场景 1.4：有车道线的道路边界且无车道中心线



1.4.1.2.5.1 Characteristic Conditions 特征条件

1. The **Departure Protection for Road Edge with Lane marking and Centre Lane Marking un-available** sub-scenario shall be relevant for **straight roads** only.
   车道为直道
2. The **Departure Protection for Road Edge with Lane marking and Centre Lane Marking un-available** sub-scenario shall be relevant, if the ego-vehicle approaches a road edge either on its **left** or **right side**.
   自车的左前轮或右前轮接近道路边界
3. The **Departure Protection for Road Edge with Lane marking and Centre Lane Marking un-available** sub-scenario shall only be relevant, if the ego-vehicle **ego-lane** is marked by a recognizable lane marking on the road edge **departure side** and is not marked by a recognizable lane marking on the **non-departure side**.
   自车车道的道路偏离侧有可识别的车道线，而非道路偏离侧无可识别的车道线
4. The **Departure Protection for Road Edge with Lane marking and Centre Lane Marking un-available** sub-scenario shall only be relevant, if the lateral distance between the approached road edge and the inner edge of the neighbored lane marking is below **cRDP_LaneMarkingRoadEdgeDistMax_met**. Also, the considered lane marking needs to be closer to the ego-vehicle than the approached road edge.
   所接近的道路边界与临近车道线内侧的横向距离需小于 cRDP_LaneMarkingRoadEdgeDistMax_met。此外，该车道线比道路边界更靠近自车。

1.4.1.3 Scenario 2: Departure Protection for Road Edges - Inner Curve Departure

场景 2：道路边界的偏离保护-向内弯道偏离

1.4.1.3.1 Scenario 场景

Departure Protection for Road Edges - Inner Curve Departure describes the scenario for the RDP function, for which the RDP function shall prevent the ego-vehicle from unintended road departure at the **inner edge of a curve**. The certain characteristic of this scenario is that the **ego-lane** is a **curved road** and that the ego-vehicle approaches a road edge at the **inside** of the curve.

RDP 功能需阻止自车无意识地偏离内弯道的边界。该场景的特性为自车车道为弯道，且自车接近弯道内侧的道路边界。

1.4.1.3.2 Characteristic Conditions 特征条件

1. The **Departure Protection for Road Edges - Inner Curve Departure** scenario shall be relevant for roads with a **minimum road curve radius** (equal to maximum road curvature, ***cRDP_RoadEdgeCurvThTriggerLookupY_1pm***). It shall not be relevant for roads with smaller curve radius.
   弯道的曲率需小于 cRDP_RoadEdgeCurvThTriggerLookupY_1pm
2. The **Departure Protection for Road Edges - Inner Curve Departure** scenario shall only be relevant, if the ego-vehicle approaches a road edge on the **inner side** of the **curve**.
   自车接近弯道内侧的道路边界
3. The **Departure Protection for Road Edges - Inner Curve Departure** scenario shall be relevant, if the ego-vehicle approaches a road edge either on its **left** or **right side**.
   自车的左前轮或右前轮接近道路边界
4. The **Departure Protection for Road Edges - Inner Curve Departure** scenario shall be relevant, if the ego-vehicle **ego-lane** is marked or is not marked by a recognizable lane marking on the road edge **departure side** and is marked or is not marked by a recognizable lane marking on the **non-departure side**.
   自车车道的道路偏离侧有或无可识别的车道线，且非道路偏离侧有或无可识别的车道线
5. The **Departure Protection for Road Edges - Inner Curve Departure** scenario shall only consider a lane marking next to the approached road edge, if the lateral distance between the approached road edge and the inner edge of the neighbored lane marking is below **cRDP_LaneMarkingRoadEdgeDistMax_met**. Also, the considered lane marking needs to be closer to the ego-vehicle than the approached road edge.
   考虑道路偏离侧的车道线，若所接近的道路边界与临近车道线内侧的横向距离需小于 cRDP_LaneMarkingRoadEdgeDistMax_met。此外，该车道线比道路边界更靠近自车

1.4.1.4 Scenario 3: Departure Protection for Road Edges - Outer Curve Departure
场景 3：道路边界的偏离保护-向外弯道偏离

1.4.1.4.1 Scenario 场景

Departure Protection for Road Edges - Outer Curve Departure describes the scenario for the RDP function, for which the RDP function shall prevent the ego-vehicle from unintended road departure at the **outer edge of a curve**. The certain characteristic of this scenario is that the **ego-lane** is a **curved road** and that the ego-vehicle approaches a road edge at the **outside** of the curve.

RDP 功能需阻止自车无意识地偏离外弯道的边界。该场景的特性为自车车道为弯道，且自车接近弯道外侧的道路边界。

1.4.1.4.2 Characteristic Conditions 特征条件

1. The **Departure Protection for Road Edges - Outer Curve Departure** scenario shall be relevant for roads with a **minimum road curve radius** (equal to maximum road curvature). It shall not be relevant for roads with smaller curve radius.
   弯道的曲率需小于阈值 cRDP_RoadEdgeCurvThTriggerLookupY_1pm
2. The **Departure Protection for Road Edges - Outer Curve Departure** scenario shall only be relevant, if the ego-vehicle approaches a road edge on the **outer side** of the **curve**.
   自车接近弯道外侧的道路边界
3. The **Departure Protection for Road Edges - Outer Curve Departure** scenario shall be relevant, if the ego-vehicle approaches a road edge either on its **left** or **right side**.
   自车的左前轮或右前轮接近道路边界
4. The **Departure Protection for Road Edges - Outer Curve Departure** scenario shall be relevant, if the ego-vehicle **ego-lane** is marked **or is not** marked by a recognizable lane marking on the road edge **departure side** and is marked **or is not** marked by a recognizable lane marking on the **non-departure side**.
   自车车道的道路偏离侧有或无可识别的车道线，且非道路偏离侧有或无可识别的车道线
5. The **Departure Protection for Road Edges - Outer Curve Departure** scenario shall only consider a lane marking next to the approached road edge, if the lateral distance between the approached road edge and the inner edge of the neighbored lane marking is below **cRDP_LaneMarkingRoadEdgeDistMax_met**. Also, the considered lane marking needs to be closer to the ego-vehicle than the approached road edge.
   考虑道路偏离侧的车道线，若所接近的道路边界与临近车道线内侧的横向距离需小于 cRDP_LaneMarkingRoadEdgeDistMax_met。此外，该车道线比道路边界更靠近自车

1.5 Handling of System Limits 系统极限处理

1.5.1 Supported Road Types and conditions
支持的道路类型和条件

1.5.1.1 Road Class Definition
道路分类定义

Road Class 1: Dedicated vehicle roads (highways, freeways, high-speed roads) having a non-traversable separation (e.g. guardrail, concrete barrier) to oncoming traffic.

Road Class 1：有隔离带的专用道路（公路，高速公路）

Road Class 2: Main vehicle roads with center lane marking and side lane markings (national roads, country roads).

Road Class 2：有中心线和侧方车道线的主要道路（国道，乡村道路）

Road Class 3: Other paved vehicle roads with visible lane markings but limited width (service roads, urban roads). Center lane marking not mandatory.

Road Class 3：其他有可见车道线，但宽度受限的道路。中心线可以没有。

Road Class 4: Other paved vehicle roads with limited lane marking quality (e.g. washed out or covered markings).

Road Class 4：其他车道线质量有限的道路

Road Class 5: Other paved vehicle roads without lane markings.

Road Class 5：其他没有车道线的道路

1.5.1.2 Bad Road Conditions
不良道路条件

The below road conditions define bad road conditions for which the RDP function is not expected to provide a lateral request support within its required KPI performance:

在以下道路条件下，不期望 RDP 功能提供横向请求支持：

1. Friction rate <= 0.3 (low μ, e.g. black ice, snow, aquaplaning, ...)
   摩擦系数<=0.3（雪，冰，水）
2. Bumpy roads with potholes
   坑洼不平的道路
3. Roads with any bad conditions that affect the ego-vehicle driving behavior in a way that the driver has to correct the vehicle's course
   道路不良条件会影响自车驾驶行为，需驾驶员纠正车辆行驶线路

The function shall offer support for all highway scenarios, national roads and country roads, which provide at least a minimal road width and are relevant for the velocity range of the ego-vehicle regarding the activation of the RDP function. This excludes:

对于所有具有最小道路宽度和符合 RDP 激活速度范围的公路，国道和乡村道路，功能需提供支持。这不包括：

1. Urban roads
   城市道路
2. Secondary roads, Service roads
   二级公路，服务道路
3. Parking lots, Parking garages, Driveways
   停车场，车库，私人车道

Although, the RDP function may be activated in these scenarios, the function shall not be able to handle all relevant situations and conditions.

尽管 RDP 功能可以在这些场景下激活，但功能不能够处理所有相关的情况和条件

The function shall offer support for the following Road Classes (see *Road Class Definition*):

功能需在以下的道路分类提供支持：

1. Road Class 1
2. Road Class 2
3. Road Class 3
4. Road Class 4
5. Road Class 5

1.5.2 Supported Lane Marking Types 支持的车道标识线种类

In case the lane markings are present in the scenario the RDP function shall offer support for all lane marking types, which show a continuous course behavior. This excludes special lane markings, which are not supposed to define a road course (e.g. like zik-zak lines, which show forbidden driving areas).

在出现车道线的情况下，RDP 功能需对所有连续车道线提供支持。这不包括特殊的车道标识线（如锯齿形的标识线）

Supported lane marking type set includes:

支持的车道标识线包括：

1. Single line straight/dotted
   单实/虚线
2. Double line straight/dotted
   双实/虚线
3. Triple line straight/dotted
   三实/虚线
4. Combinations of before mentioned lane markings
   以上标识线的组合

The lane marking shall have a minimum length of **RDP_LaneMarkingValidLengthMin_met**.

车道标识线需有最小的长度 cRDP_LaneMarkingValidLengthMin_met

1.5.3 Supported Lane Marking Colors 支持的车道标识线颜色

In case the lane markings are present in the scenario the RDP function shall offer support for all lane marking colors, which are commonly used.

在出现车道线的情况下，RDP 功能需对所有常见的车道线颜色提供支持。

Supported lane marking colors basically includes:

支持的车道标识线颜色包括：

1. White lines
   白线
2. Yellow/orange lines
   黄/橙线
3. Red lines
   红线
4. Blue lines

蓝线

1.5.4 Supported Road Edge Types 支持的道路边界类型

The following road edges shall be considered by the Road Departure function:

RDP 功能需考虑以下道路边界类型（不支持路牙）：

1. Transition from road surface to snow
   道路表面到雪地
2. Transition from road surface to sand
   道路表面到沙地
3. Transition from road surface to grass
   道路表面到草地
4. Transition from road surface to paved road
   道路表面到铺面道路
5. Transition from road surface to soil
   道路表面到泥地
6. Transition from road surface to road drop
   道路表面到道路下沿

1.5.5 Supported Curve radius 支持的弯道半径

The RDP function should work properly for curve with a curvature equal or below the tolerated threshold. The curvature threshold shall depend on the ego-vehicle velocity.

RDP 功能应在曲率小于或等于阈值的弯道上正常工作。该阈值取决于自车的速度

1.5.6 Supported Environmental conditions 支持的环境条件

Environment conditions like rain, sunlight do affect the RDP function performance directly, since they affect the detection of the road edges and lane markings. Nevertheless, for little environment limitations the RDP function shall provide reliable performance.

类似雨和阳光照射的环境条件的确会影响 RDP 功能的性能，由于它们会影响道路边界和车道线的检测。但是在较小的环境限制下，RDP 功能应提供可靠的表现。

The RDP function is allowed to show limited performance and is not expected to provide lateral intervention support within its required KPI performance, if one of the following environment restrictions or a combination of them applies:

若以下任意环境限制或它们的组合发生，则允许 RDP 功能出现有限的性能，且不期望功能在要求的 KPI 表现内提供横向干预支持：

1. Fog with visual range less than 50 meters
   可见度小于 50 米的雾
2. Heavy rain/mist at day
   白天的大雨/薄雾
3. Normal rain/mist at night
   夜晚的雨/薄雾
4. Glare from sunlight (deep sun on sunrise or sunset)

太阳强光（日出或日落）

5. Snow/ice on the road.
   路上的雪/冰
6. Snowfall at day and night.
   白天和夜晚的降雪
7. Light reflection from wet or salty road surface
   来自潮湿或含盐的道路表面的光照反射

2 Parameters 参数

Function's parameters used in the function have influence on the behavior of the function. These parameters are used to optimize the function's performance depending on the country, the used vehicle's model and some customer specific requirements.

功能使用的参数对功能的性能有影响。根据国家、所使用的车辆模型和客户具体的要求，这些参数用来优化功能的性能。

2.1 Function parameters

Function parameters are placeholders for constants, which are used to describe the functional behavior.

功能参数为常数，用以描述功能行为。

Sl. No.	Parameter	Description	Value and Unit
1	cRDP_VehicleSpeedMin_mps	Minimum allowed value of the displayed longitudinal velocity for the RDP 最小速度	50 km/h
2	cRDP_VehicleSpeedMax_mps	Maximum allowed value of the displayed longitudinal velocity for the RDP 最大速度	145 km/h
3	cRDP_VehicleSpeedMinHyst_mps	Hysteresis below the minimal threshold of the ego-vehicle's velocity 最小速度滞后	5 km/h
4	cRDP_VehicleSpeedMaxHyst_mps	Hysteresis above the maximal threshold of the ego-vehicle's velocity 最大速度滞后	5 km/h
5	cRDP_VehLongAccelerationThTrigger_mpss	Tolerated max. longitudinal acceleration to allow RDP to start a lateral intervention. 最大纵向加速度	2.95 m/s^2
6	cRDP_VehLongDecelerationThTrigger_mpss	Tolerated max. longitudinal deceleration to allow RDP to start a lateral intervention. 最大纵向减速度	-2.95 m/s^2
7	cRDP_VehLatAccelerationThTrigger_mpss	Maximum allowed value of the lateral acceleration for the RDP. 最大横向加速度	2.45 m/s^2
8	cRDP_VehLongAccelerationThHyst_mpss	Hysteresis of the longitudinal acceleration for the RDP. 纵向加速度滞后	0.05 m/s^2
9	cRDP_VehLongDecelerationThHyst_mpss	Hysteresis of the longitudinal deceleration for the RDP. 纵向减速度滞后	0.05 m/s^2
10	cRDP_VehLatAccelerationThTriggerHyst_mpss	Hysteresis of the lateral acceleration for the RDP. 横向加速度滞后	0.05 m/s^2
11	cRDP_InterventionBlockingTime_sec	Duration of the blocking time between two LDP lateral interventions. 功能干预间隔时间	2 s
12	cRDP_InterventionCancelControlTimeMax_sec	Maximum allowed lateral control time before cancelling an ongoing lateral intervention. 最大控制时间	5 s
13	cRDP_LaneMarkingRoadEdgeDistMax_met	Maximum Distance between a lane marking and a road edge if lane marking is also present on the hazardous side. 车道线与道路边界的最大距离	0.5 m
14	cRDP_RoadEdgeCurvThTriggerLookupY_1pm	Maximum tolerated curvature to start a lateral intervention depending on the ego-vehicle velocity. 最大弯道曲率	LUT
15	cRDP_LaneMarkingValidLengthMin_met	Minimum Lane marking length if present and detected 最小车道线长度	LUT