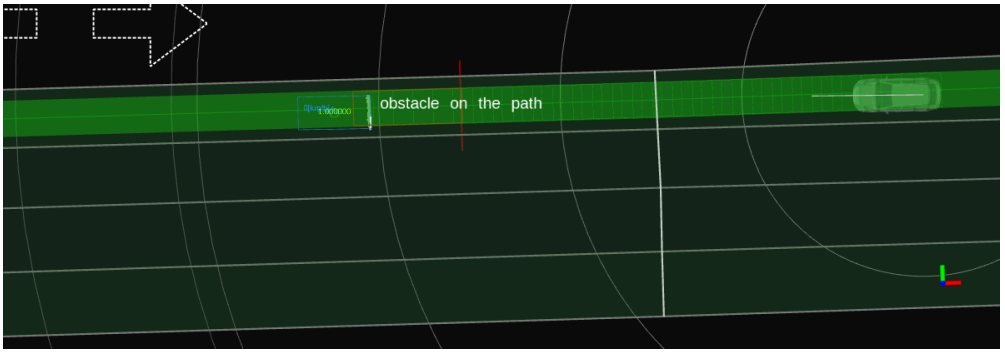
Avoid obstacles near the center line in behavior_path_planner #2799

shulanbushangshu started this conversation in **Design**

shulanbushangshu on Aug 16, 2022 Collaborator

In the current obstacle avoidance module, obstacles near the center line (filtered by the parameter threshold_distance_object_is_on_center) cannot be processed.
Even when the parameter "threshold_distance_object_is_on_center" is equal to 0 (considering all obstacles), the calculation of the current offset direction cannot solve the following situation:
When the center of the obstacle is located on the left side of the center line (very close to the center line), but there are adjacent lanes on the left side (which can be used to avoid obstacles).

Simulation as shown blow:



Current design as shown blow::

Avoidance #

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The Avoidance module is activated when dynamic objects to be avoided exist and can be safely avoided.

Target objects

Dynamic objects that satisfy the following conditions are considered to be avoidance targets.

- Semantics type is `CAR`, `TRUCK`, or `BUS`
- low speed (default: < `1.0 m/s`)
- Not being around center line (default: deviation from center > `0.5 m`)
- Any footprint of the object in on the detection area (driving lane + `1 m` margin for lateral direction).

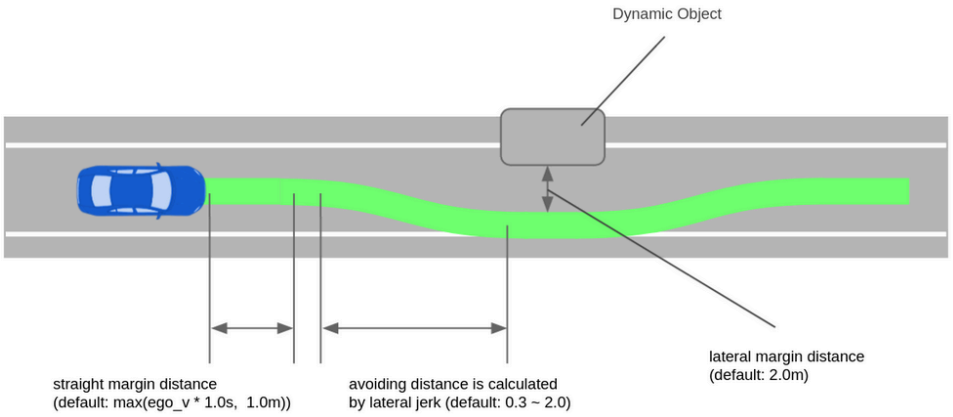
Category

Design

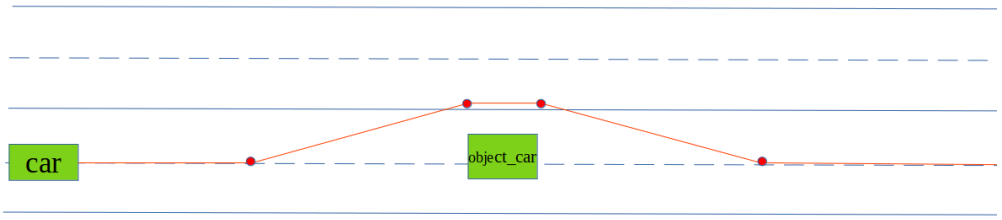
Labels

component:planning

3 participants



But under the actual road conditions and the daily use of test roads, this situation is common.There are often stopped vehicles on standard roads (parked near the centerline).The current design can be considered to be improved to solve such road condition.
In the calculation of offset direction and offset distance, this type of obstacle should be considered to achieve obstacle avoidance operation



↑ 1

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zulfaqar-azmi-t4 on Aug 16, 2022 Collaborator edited

Hi **@shulanbushangshu**

Such design is currently mentioned as limitation, as mentioned here Improved performance of avoidance target selection. It is tricky from the perception alone to distinguish between cars that are stopping in the middle (for example waiting for traffic light, etc) or car stopping in the middle due to broken or car stopping in the middle due to parking.
We don't want the avoidance to automatically trigger while waiting for front vehicle to make a turn nearby a junction.

Maybe we need some kind of logic for it?

> When the center of the obstacle is located on the left side of the center line (very close to the center line), but there are adjacent lanes on the left side (which can be used to avoid obstacles).

On the other hand, for this case, we might also need to think of the impact in terms of the safety? For example, in two lane road, if the adjacent road is opposite direction, we might potentially not be able to see the incoming vehicle.

↑ 1 0 replies

shulanbushang... on Aug 16, 2022 Collaborator Author edited

Hi,@zulfaqar-azmi-t4.
Thank you for your explanation.Yes, as you said, when dealing with this situation, we need to consider issues such as waiting for traffic lights, driving safety and intersections.
At present, does the planning module consider handling this situation in "avoidance_module", or develop a new scene model

↑ 1 1 reply

zulfaqar-azmi-t4 on Aug 23, 2022 Collaborator

Hi @shulanbushangshu
As I am not well versed in this matter, I will try and ask to see if there is any information regarding this matter. I'll let you know if there are any updates.

satoshi-ota on Aug 30, 2022 Maintainer edited

Hi @shulanbushangshu cc @TakaHoribe
I and TIER IV would like to improve following unimplemented parts in this site in the near future (the end of this year 🤔):

- Safety Check
- Cancel avoidance when target disappears
- Improved performance of avoidance target selection

> When the center of the obstacle is located on the left side of the center line (very close to the center line), but there are adjacent lanes on the left side (which can be used to avoid obstacles).

Additionally, we'll try to support this situation by fixing avoidance path generation logic and adding safety check logic.

↑ 1 0 replies