

Bus stop handling in bus ODD #2651

Unanswered mehmetdogru asked this question in Ideas



mehmetdogru on Jun 7, 2022 Maintainer

I would like to start a discussion about bus stop handling where the bus stops to take the passengers. In ODD definition we already have a case however it is not yet decided completely how it is gonna be implemented.

Use Cases #	EGO vehicle behavior	Simulation Scenario	Parameters
UC-PB-006-000 1 UC-PB-006-000 4	<ul style="list-style-type: none">· EGO slowly approaches the bus stop and precisely docks to it <p>Target docking precision: Longitudinal $\pm 50[\text{cm}]$ Lateral $\pm 50[\text{cm}]$</p>	<p>■ Success condition EGO runs in the lane at V_e and approaches the bus stop</p> <p>■ Action Dock to the bus stop precisely</p> <p>■ Success condition · Error of the stopping position is less than $\pm 50\text{cm}$(Longitudinal) and less than $\pm 50\text{cm}$(Lateral)</p> <p>■ Failure condition · Error of the stopping position exceeds the above target</p>	<p>· V_e: $[30, 50]$ km/h · Total 2 patterns</p>

We discussed briefly in ASWG meeting so [@mitsudome-r](#) and others who would like to share their ideas, please do so.

I think it would be nice, efficient and easy to debug and visualize it if we would have bus_stop annotations which have a polygon where the bus can pull over to take the passengers. That way it would be easy to assign the bus to the related bus stop with ids and I guess it is also suitable with the current planning stack structure that way.

What do you say?

↑ 1

Category

Ideas

Labels

component:map
component:planning

7 participants



5 comments · 14 replies

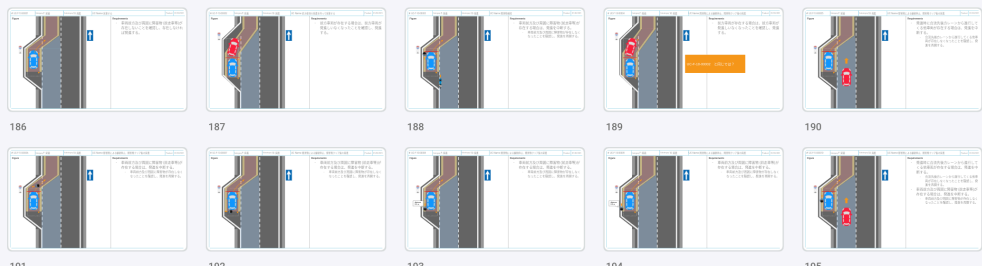
Oldest Newest Top



taikitanaka3 on Jun 7, 2022 Collaborator

I would like to start a discussion about bus stop handling where the bus stops to take the passengers. In ODD definition we already have a case however it is not yet decided completely how it is gonna be implemented.

I'm going to answer first part. Currently in tier4 we are making scenarios for case by case and these usecases are covered by behavior and motion planning modules which is already implemented.



↑ 1

10 replies

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Igata-ctrl on Jun 9, 2022 Collaborator

edited ▼

I was to offer the translation, too, but thanks, @LalithVipulananthan.

The original bus stop use case which [@mehmetdogru](#) showed above is based on a request from an OEM in the bus project in TIER IV group. As for the numbers like +/-50cm, we might want discuss with ITRI.



mehmetdogru on Jun 14, 2022 Maintainer Author

@LalithVipulananthan When you complete the translation of the doc could you notify us here, thanks a lot!



ghost on Jun 30, 2022

[@mehmetdogru](#) [@Igata-ctrl](#) My apologies for the delayed response. The English translation of the slides above is attached below:
[Bus stop ODD Use Cases.pdf](#)



mehmetdogru on Jul 3, 2022 Maintainer Author

@LalithVipulananthan Thank you very much!



mehmetdogru on Aug 4, 2022 Maintainer Author

edited ▼

[@taikitanaka3](#) [@mitsudome-r](#)

I have a question about this topic which we realized it when we were talking about UI design for Bus ODD so I would be grateful if you could answer it.

So for bus to stop at the bus stop what will you need; will you need a checkpoint around the bus stop sign/inside the bus stop polygon?

Or autoware will extract from the route somehow the bus stops and take action?

~~I will create an issue about handling multiple goal points in autoware which I think it is a must for Bus ODD. But since they might be kind of related I wanted to ask you first what are your intentions/ideas about these topics?~~

edit: Sorry about my confusion. I forgot that in autoware.universe there is already a checkpoint implementation :)



JToolGD on Jun 7, 2022

I'm curious about the +/- 50cm lateral. That's a range of 1m, right? Unless I'm mistaken, most buses (at least here in The Netherlands) stop at around 30cm from the curb (might even be less). I'm also pretty sure most bus stops (again, in The Netherlands) don't have the space for a bus to be 1m from the curb (it would cross over onto the next lane).

↑ 1

1 reply



mehmetdogru on Jun 8, 2022

Maintainer

Author

edited ▼

Thanks for the input. That is the rough definition of the scenario of course, for different kind of needs and situations different ODD scenarios are needed. And with [the way I think how it should be implemented](#), your case would be covered.



chishengshih on Jun 7, 2022

Collaborator

Agree that there are many exceptions.

Current scenario assume that there are not obstacles between curb and bus. What if there are obstacles? For example, illegal parking or illegal double parking when there is no such bus bay. Will the bus wait until the space is clear? Or, skip this stop and move the next stop?

For safety, the bus should wait till the space is clear. How does the bus notify other vehicles to move and clear the space?

Best,
Daniel



↑ 1

1 reply



mehmetdogru on Jun 8, 2022

Maintainer

Author

edited ▼

Thank you very much for the input. Of course possible scenarios are endless just like other missions such as lane driving, lane change etc which the bus should handle in normal urban traffic. But these improvements and scenario coverage must be done step by step I believe.

What I wanted to discuss more first what should be the approach in defining bus stops for planning stack to handle efficiently and for easy debugging actually.



1



brian841102 on Jun 21, 2022 Collaborator

I think using the lateral/longitude error as the criteria is nice. In my opinion, the comfort of passengers on the bus is also important, it would be nice if the acceleration/deceleration of ego vehicle be included as a factor to evaluate bus stop handling.

↑ 1

0 replies



BonoloAWF on Jul 28, 2022

@mehmetdogru is there a consensus on the implementation details for this feature? Has an issue been created for this?

↑ 1

2 replies



mehmetdogru on Jul 28, 2022 Maintainer Author

I think it is a very good design for this feature. I am not aware of any related issue.



BonoloAWF on Jul 28, 2022

Thanks for the update. I'll create an issue to discuss at the next meeting.