Include reactive methods in the general discussion in the introduction

1- I can add one or two paragraph for reactive methods with citations. I can compare two approaches in these paragraphs.

-> yes.

Discuss applicability of our method to other roads

I think we can have one of two actions fort his:

1- Maybe we can analyze a small section of a rural road using OSM or Here maps data. We can add the output to road representation results part.

2- We can discuss that rural roads have higher curvature than highways but they can still be approximated by arc-splines only the order would increase. Cities mostly have structured road networks therefore they do not have any curvature. Consequently city road networks would not be efficient to approximate with arc-splines. Lines are better for cities. We can mention this in road representation methodology part.

-> You could try some rural road from OSM (we do not need the multi-lane case here). After that, let's discuss again.

We can write a paragraph that explains how the road representation is used. We store the data of the road representation. In real-time, we want to compute waypoints, heading and curvature information of the road segment where the vehicle is driving. If we use a clothoid representation, we need to simulate. If we store waypoints, we need a lot of memory.

1- After “Generation of Additional Lanes from a Single Lane” I can maybe add another short section to describe how can the data can be used. This paragraph may be added to the end of “Generation of Additional Lanes from a Single Lane” section. We can explain the memory usage of clothoids quantitatively since it is intuitive.

-> Yes, maybe you can first describe the road representation and then describe how you would quickly compute waypoints for a road segment

Can we check how long it takes to compute waypoints when simulating clothoids?

1- We can measure the computation time for simulating clothoids. Should we also measure computation time for arc-splines? If yes, I may need to optimize the code since it is not very optimal for now, clothoid computation on the other hand is more optimal.

-> We should measure both and compare

Show memory for same accuracy straight line segments. In the thesis, we only show the memory requirement of arc-splines.

1- The following paragraph is in the 45th page of the thesis under “RMSE Spatial Coordinates” subsection. “Line segments are simpler than arc-splines, they require only the starting and end point of the segment with single precision floating point for each of them. Therefore each line segment takes 16 bytes of memory.” The accuracy is the same as arc-splines (Euclidian max and rms are the same, for line segments maximum heading error is also imposed).

-> that is not what I meant. The question of Afsar Hoca was more like this: Assueme you have a curved road and you approximate it by an arc-spline with a certain accuracy. How many straight-line segments would I need to get the same accuracy

Emphasize heading and curvature availability when using arc-splines wherever possible

1- I can add a paragraph after adding the paragraph explaining the usage of our road representation. This way we could emphasize the heading and curvature availability right after the usage of the road representation.

-> yes. in the same paragraph/section where you explain the computation of waypoints. Show that you do not only compute the position but also heading and curvature easily

Check what happens when parallel shifting. Is there an error? For arc-splines, I would expect that we always go along the radius. There could be a problem with consecutive line segments that have a different heading.

1- I’ll inspect line and arc-spline segments and get back to you with some zoomed in figures. I do expect a little error but it would be so small that it would not matter in my opinion.

-> you can check it in the plots but you can also draw it on paper

Simulate a bit longer such that we see convergence to the road centerline

1- The simulations show almost zero tracking error for trajectories. It is also known that the trajectories reach the road centerline therefore we can safely say that the vehicle converges to road centerline. For better illustration I think I can also plot the lane boundaries and maybe extend the road centerline a bit more. I think we could face numerical instabilities if we want to simulate the vehicle to follow the road centerline more.

-> I did not understand the problem with the instabilities. Our trajectory is the computed trajectory until we reach the road centerline. After that, we just use the road centerline as reference. This should work without any problems.