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Transition Areas for

Infrastructure-Assisted Driving

Project Goal

- Traffic management during the transition phase towards full AV penetration to increase traffic efficiency and safety
- The focus is on automated vehicles and preventing them from having to hand over control back to the driver in difficult situations

Dynniq Challenge

- New ramp metering algorithm
- New C-ITS application to assist safe merging at on-ramp
- Modeling tools for simulation of motorway on-ramp situations
- Extended message sets for providing advice for traffic merging situations to cooperative and automated vehicles

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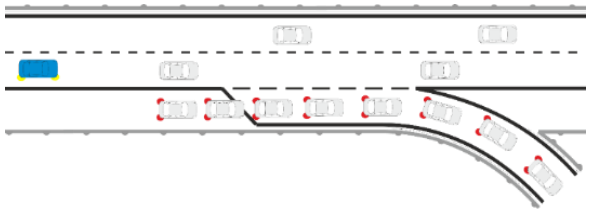
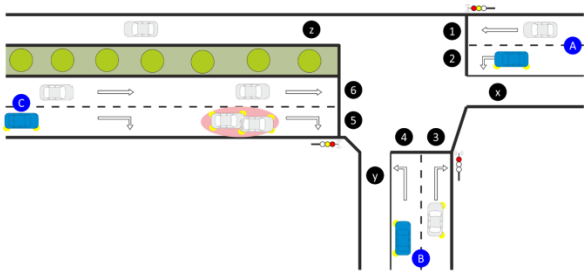
Use cases

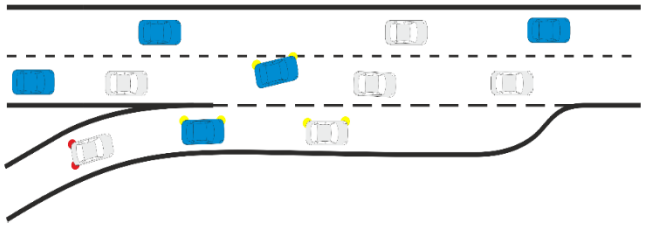
1:
Queue spillback at exit ramp



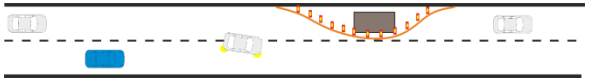
3:
Intersection handling due to incident



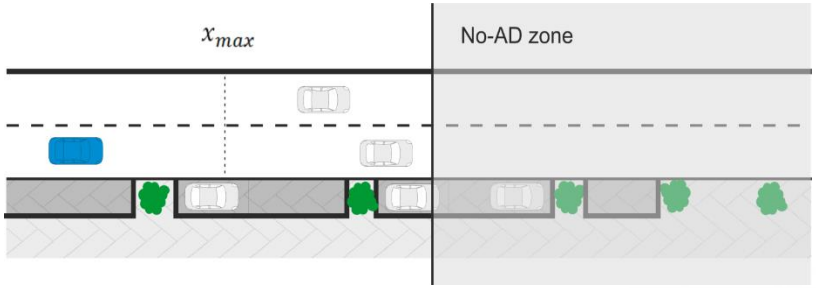
2:
Motorway merging



4:
Safe spot in lane of blockage & Lane change Assistant



5: Distributed safe spots along an urban corridor



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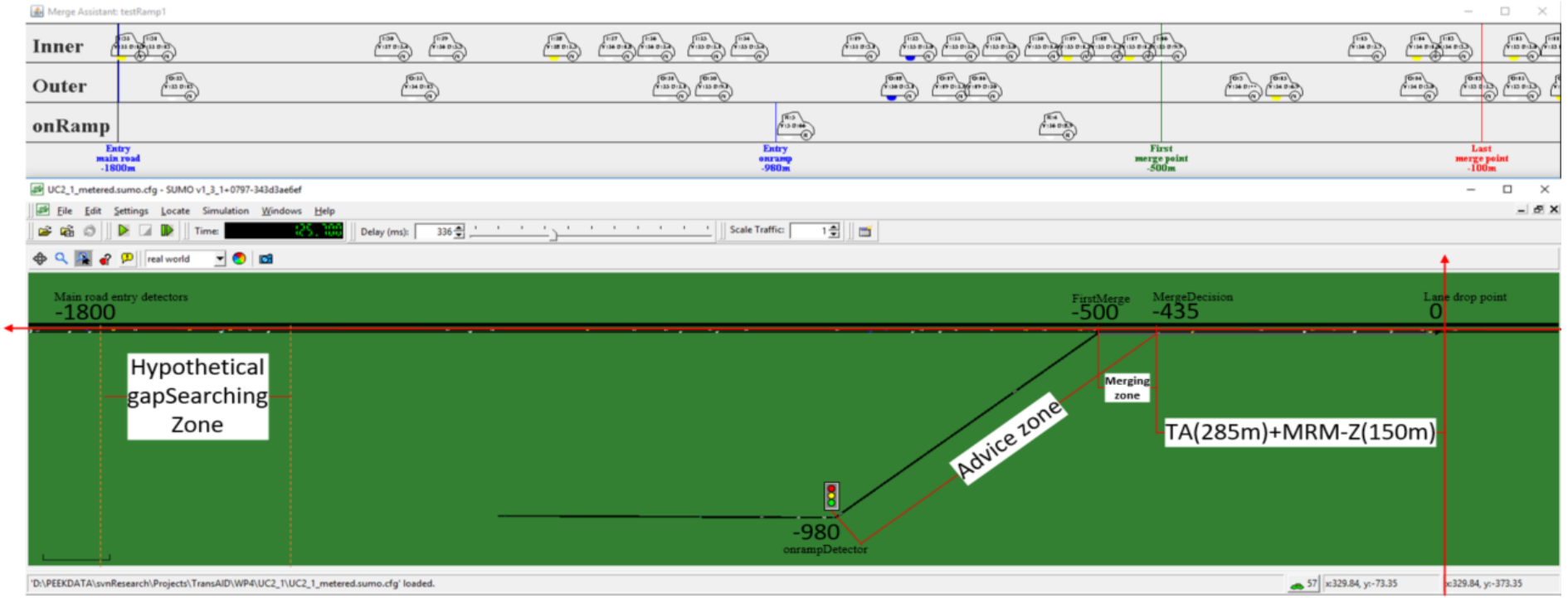
Ramp metering: Scenario



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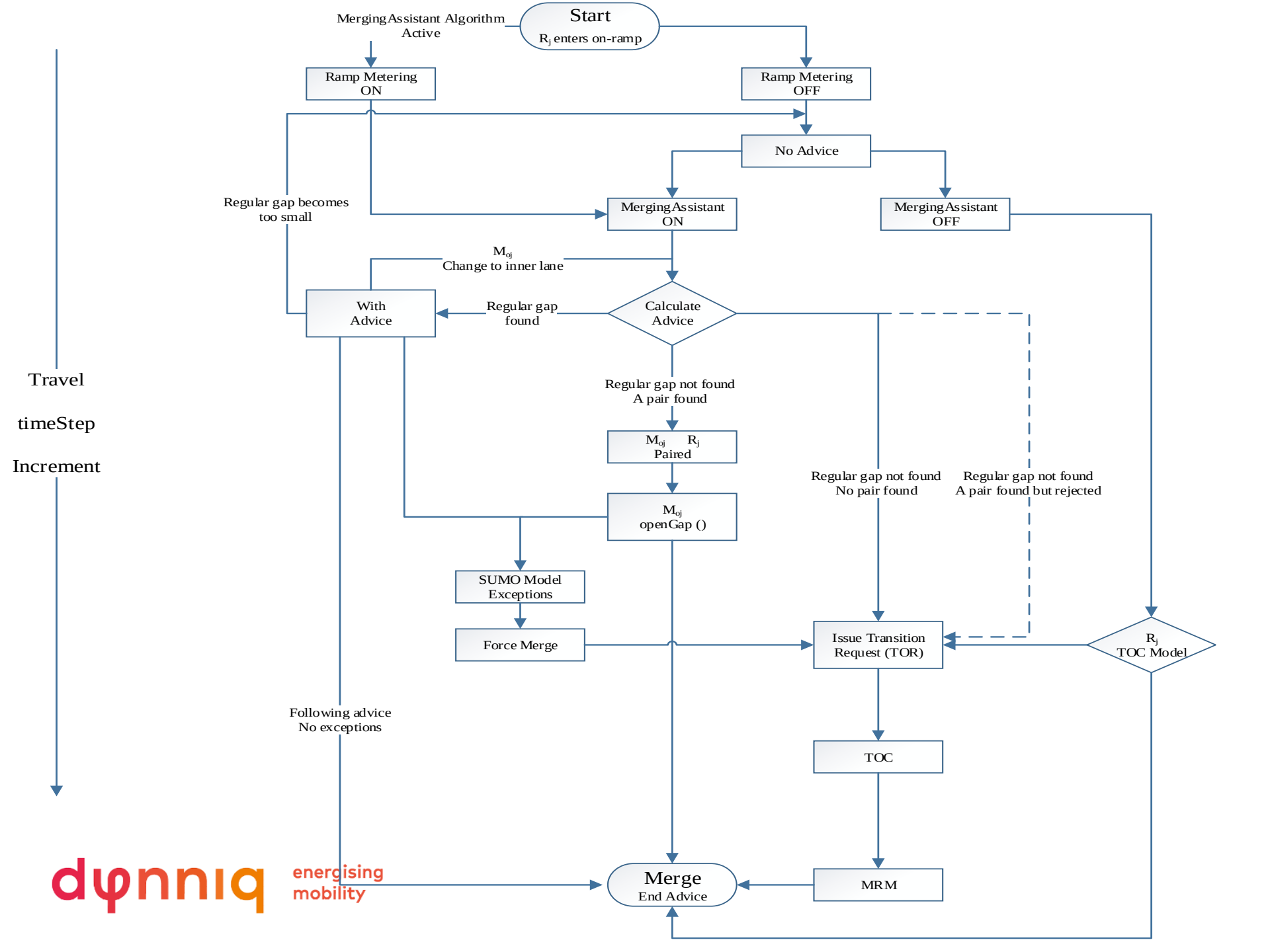
Ramp metering: Algorithm


Merging Assistant Algorithm Active
Start
R_j enters on-ramp
Ramp Metering ON
Ramp Metering OFF
No Advice
Regular gap becomes too small
Merging Assistant ON
Merging Assistant OFF
M_{oj} Change to inner lane
With Advice
Regular gap found
Calculate Advice
Regular gap not found A pair found
M_{oj} R_j Paired
M_{oj} openGap ()
Regular gap not found No pair found
Regular gap not found A pair found but rejected
SUMO Model Exceptions
Force Merge
Issue Transition Request (TOR)
R_j TOC Model
Following advice No exceptions
TOC
Merge End Advice
MRM
Travel timeStep Increment
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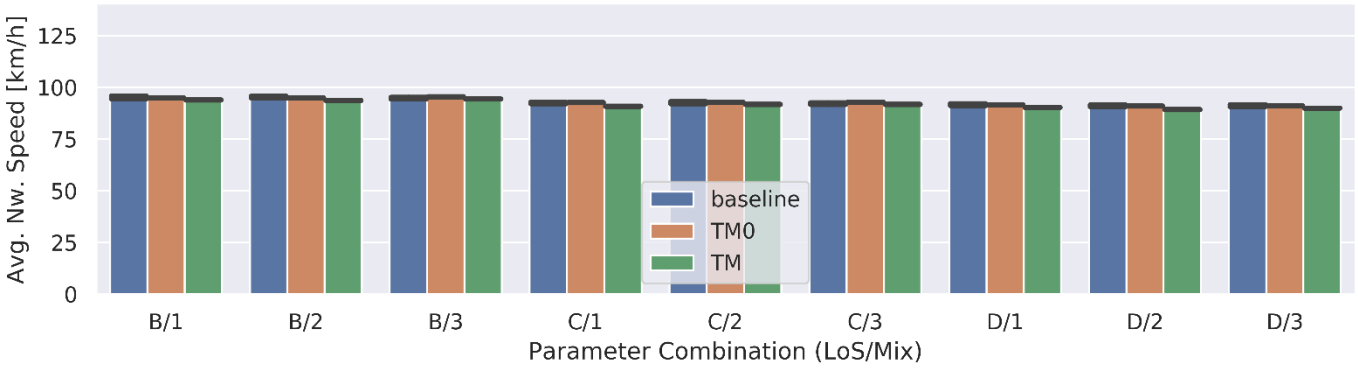

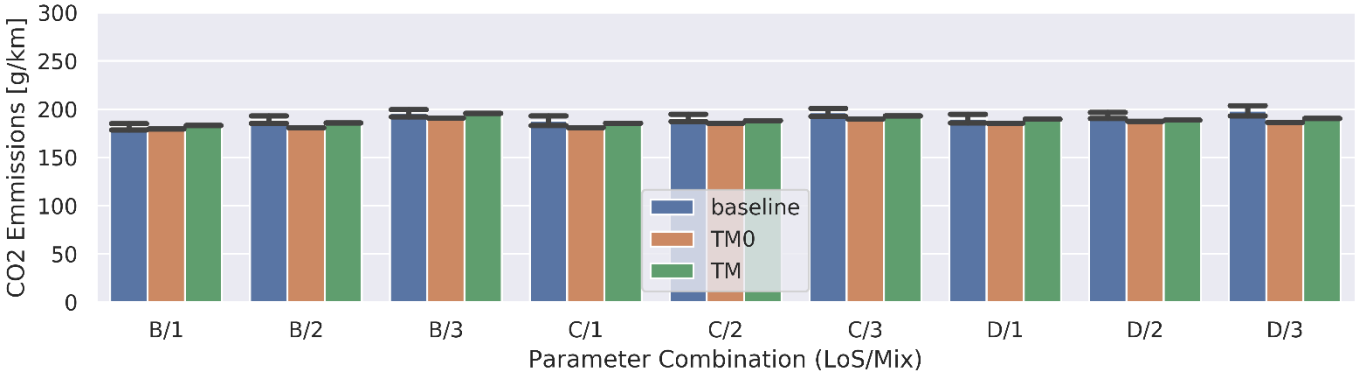

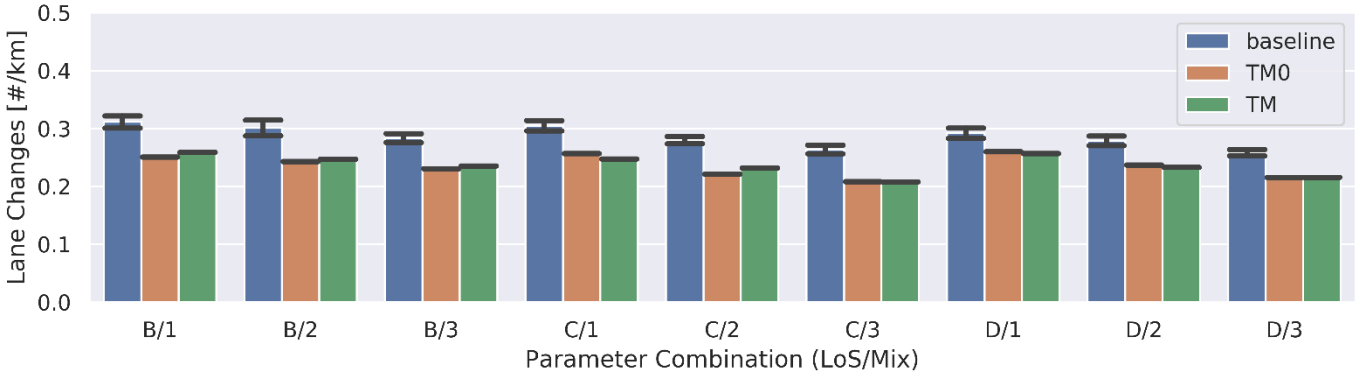

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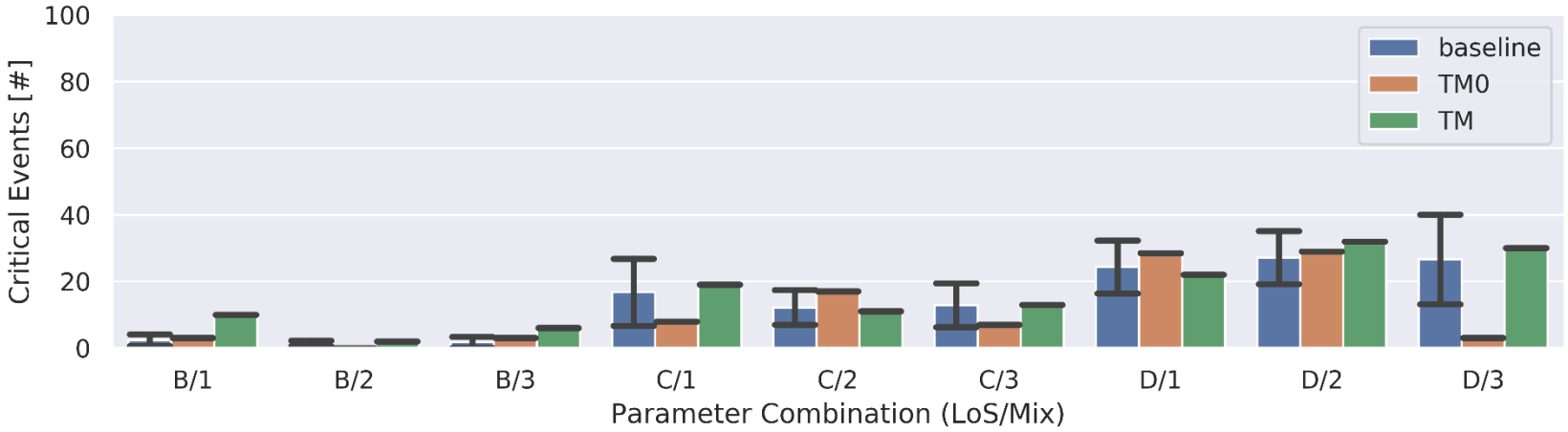

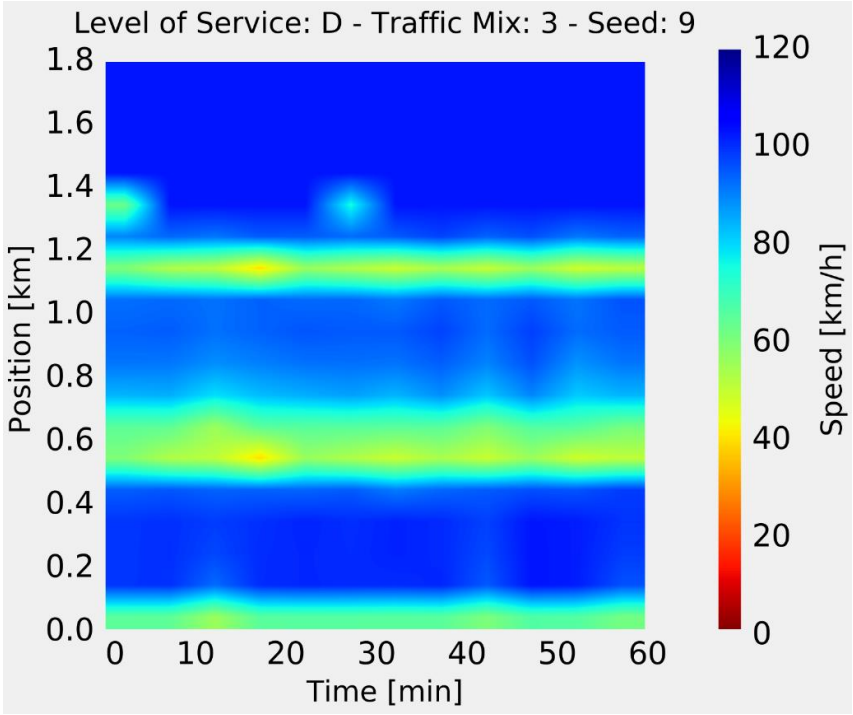

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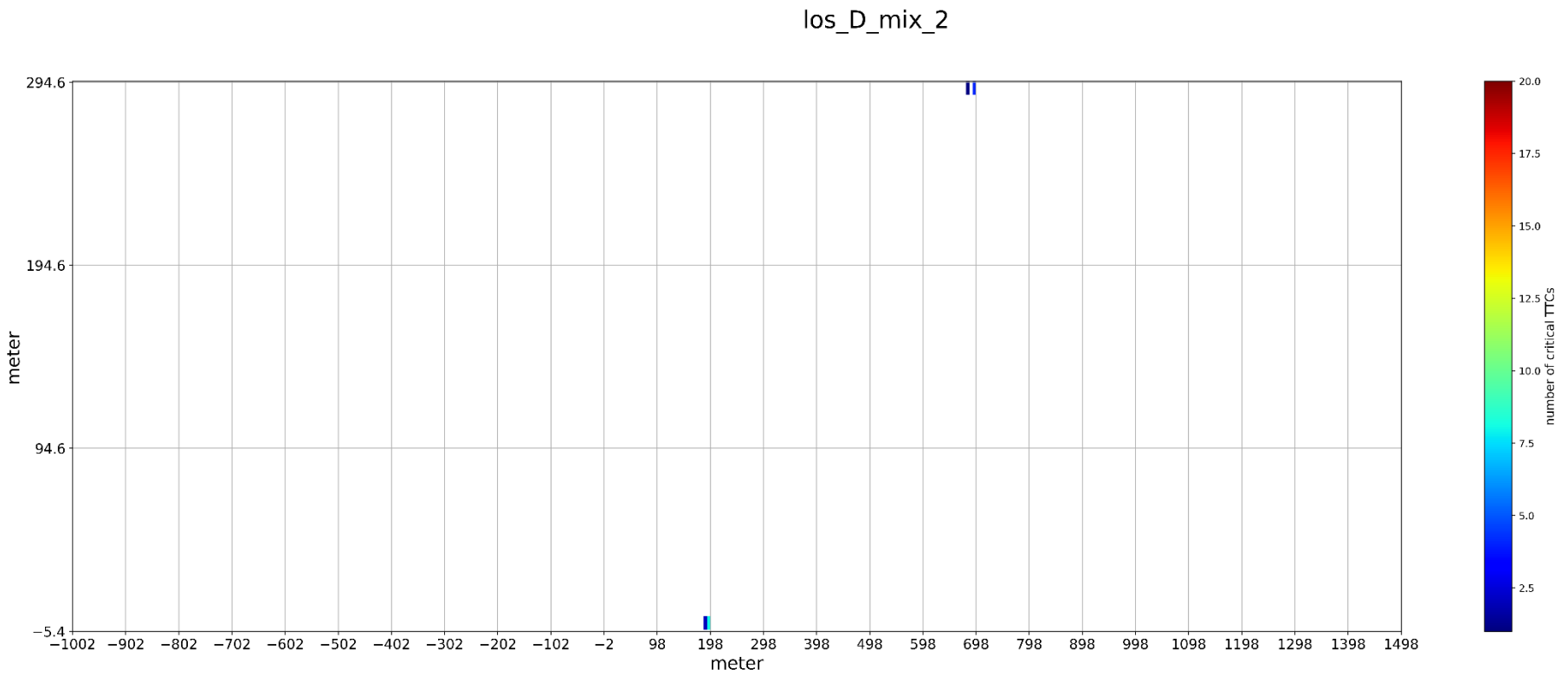
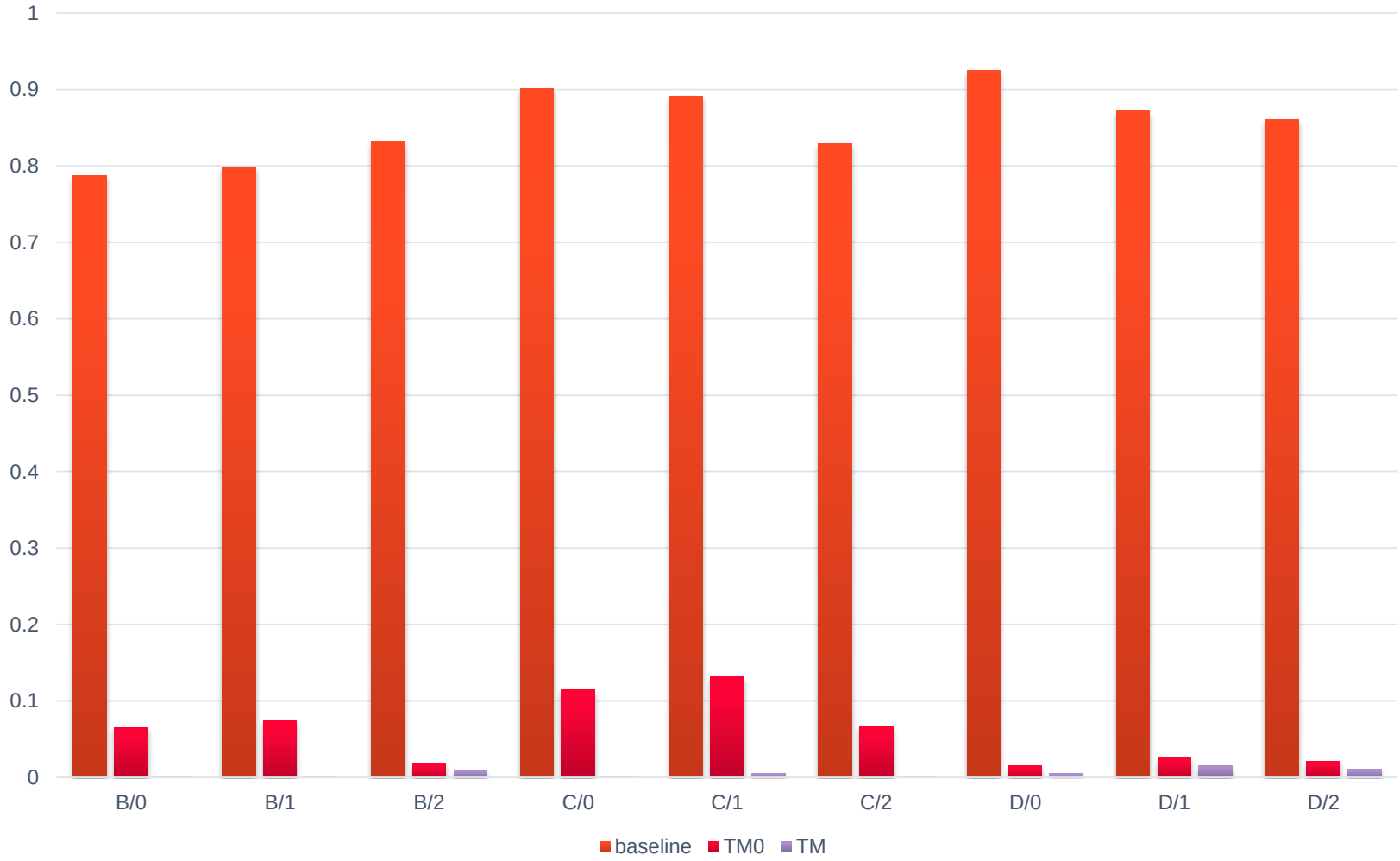


CAVs ToC percentage



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Thank you!

Questions?

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