Ruter#

Minutes of Meeting

Date: 13.06.2022
Time 0830 – 1700 CEST
Place: Ruter S, Jernbanetorget 1, 0154 Oslo, Norway / Remote
Participants: Participants enrolled in the conference

Dialogue conference: How can we transform public transport with automated on-demand mobility

Presenter	What
Ruter	**Welcome w/ Bernt Reitan Jenssen (CEO, Ruter)** • Bernt welcomes the participants • Ruter wants to provide people the freedom to move in a sustainable way • We have an opportunity to make sure these opportunities play out the right way • Ruter as a force for getting to net zero by making green public transport available • It is not just about making the driver obsolete, but also about creating a better customer experience **Ruter's ambitions and plans for automated mobility w/ Endre Angelvik (Executive VP Radical Innovation, Ruter)** • Transformation of an entire transportation system, which then will transform society • Part of the goal for the dialogue conference is for the participants to meet with each other • Endre shares Ruter's take on the future: private vehicles banned in city centers by 2030 and 30.000 EVs to replace them "as soon as possible" • Sharing more to get to a more sustainable future • Sustainable freedom of movement as a company and region vision
Oxbotica	Oxbotica presents themselves.
CEVT	CEVT presents themselves **Questions:** • What kind of partnership are you looking for?

	◦ We need to connect with AV providers, will collaborate closely to Mobileye, but the vehicle platform is agnostic to AV supplier • Most important driver to make change is to show people the technology, as it was the case with el-cars
Schaeffler	Schaeffler Technology presents themselves. **Questions** Q: Henrik Anderburg Unibus. Are you going to be an OEM or partner with someone else? A: Partner Q: Have you decided a partner yet? A: Yes.
AFRY	AFRY presents themselves digitally. **Questions** Q: When do you think we will see AV services at scale in Europe? A: It depends on what you mean by scale. From my perspective av-driving is here, but there are not that many yet. They have it in Heathrow for example, but it is not very accessible. It will be a gradual shift. I think it will be before 2025 in specific cases. We need to think of the use cases – where can we provide value today?
Mobility Forus	Mobility Forus presents themselves. **Questions** Q: Do you think the purchasers are getting ready to purchase this type of service? A: I think we are in a crossroads. We are happy to see Ruter and other players push forwards. We are looking forward to having the technology that serves a purpose and to get to a stage where we can remove the safety driver.
ITS Norway	ITS Norway presents themselves: The CCAM partnership and ongoing CCAM projects **Questions** Q: How can the industry change the legislation on the European level? A: You demonstrate and show what is needed. You need some sort of sandbox.
SAMS Norway	SAMS Norway presents themselves.

	Questions Q: Do the players in SAMS articulate international needs that are currently not a part of the cluster? A: The major focus is the last mile delivery. Water shuttles and water ways. Q: Do you see any other requests of needs from your partners? A: One concern is the combination between what ITS represents and what SAMS represents. There needs to be a connectivity that we haven't had before. It is a bit of a waiting game. What Ruter is doing is supporting the wishes of our member community.
NEVS	NEVS presents PONS and themselves. **Questions** Q: I saw the pilot you had in Stockholm. Are you doing this yourself or are you connected with a PTA? A: The picture was is Stockholm. We are looking for three different pilot cities with up to 20 vehicles per city. We understand that we need to have a open API to connect with e.g. Vy or Holo. We are still looking for the first pilot project. Q: How do you see the business model for NEVS? How are you financed? A: The business case in the long term is taking out the driver and sharing a vehicle. Who is going to pay for that? It can be a combination of public and private payments. E.g., the public pays for peak hours and IKEA pay for trips that goes to their warehouses. Q: Can you elaborate on the scaling? A: We will build ca. 200 vehicles in the beginning. The architecture we are building is scalable. We can build different top hats adjusting them in a very flexible way. It is easy to stave of high production methods. Q: Are you testing the tech on open roads? A: Yes, Oxbotica is. They are our software providers. We have approved our vehicles on the road in Sweden.
GHT Mobility / CleverShuttle	Clever Shuttle presents themselves. Q: Have you started automation of vehicle services? A: No, it is all driver based. Q: What has been the most difficult challenge to solve based on customer use case.

	A: We optimize when it comes to charging the vehicle, so there is no problem.
Volkswagen Commercial Vehicles	VW presents themselves remotely. Q: Will you deploy in new cities or markets with the same value chain? A: It depends on the market; we are looking at both. We are looking at partnering with local PTOs or other mobility services. Q: Are you considering implementing goods or logistics services? A: We are also focusing on transport as a service.
Mobileye	Mobileye presents themselves. Q: Ski transport on the roof – will this be provided in the future? A: We can drive as a reasonable human driver. We are working on different types of vehicles for different use cases. In the future there will be a vehicle that suits your needs.
Telenor Norge	Telenor Norway presents themselves. Q: Reliability and restoration of service as a critical part. Does Telenor need to change their network in the future? A: Yes, we are building the new network with 4G and 5G. It is built more robust and at a higher cost. How do we interact with you as a customer? Yetimove needs to talk to the right people when the system is not working. We need to work closer with the supporting and operation system. Q: Telco is often seen as capitol intensive industry. Any tips to the AV industry. A: No, probably not.
Holo	Holo presents themselves. Q: Can you say something about the maturity of the vehicle companies on the API side? A: We have experience with Navia and Sensible4. Once we start asking questions, we can see that there is work to be done. The requirements we set there go beyond the core of the software. If you try to be the best on all areas, it is more difficult. We had a good collaboration with Sensible4. Q: Is there any part of the value chain or ecosystem missing to reach level 5?

	A: We haven't reached level 4 yet. We are waiting for the best hard- and software. Ruter is ready as the customer, we are ready as the implementer and as soon as a supplier is ready, we are ready.
McKinsey	McKinsey presents themselves Q: What is your view on market expansion in cities. Over deployment of different brands of e.g., scooters. A: I believe we will see different models. Europe more shared av centric. Cities will play a bigger role. Difference in vehicle sizes. China will see different types of vehicles. Europe is the one continent that has the largest change of replacing the vehicle fleet massively. This requires policy. Q: Will there be room for many players in the city or few? A: If I were a city, I would have 2-3 players in my city. I would have them bookable in my app. I would have someone that orchestrates the service in the back. It has to be integrated, buy I would hedge on having more than one operator. Q: Pinpointing AD systems as the most prominent bottleneck. What is the next bottleneck in the industry? A: Think of the 40.000 vehicles in Norway. Several vehicles needs to be made and maintened. Q: How do you see the competitive landscape evolving? A: I don't think the car manufacturers will have a major player. It will probably be dominated by the tech. Truly understanding how these fits in the entire system. How can you integrate into a mobility system and urban mobility system?
Applied Autonomy	Applied autonomy presents themselves Q: You have worked with both small and big vehicles. What has been the biggest issue automating large buses? A: They needs more room – parking and city regulations a challenge. Implementation in Stavanger has been one of the most challenging locations, as it is located right next to a cruise harbor with a lot of taxis and people. Wrong parked cars and regulations also challenging.
ioki	Ioki presents themselves Q: What is Ioki's take on retrofitting AVs on buses or cars already in place? A: We do have it already today, in several cities, we see that it absolutely works.

MOIA	MOIA presents themselves Q: Is VW's id.buzz a bridge solution, or will WV provide these to the whole European AV market? A: This is a bridge solution - awesome vehicle but has some compromises. Not the final answer from VW on how to conquer this market. Q: Collaboration: is MOIA seeking other vehicle partners than VW? A: Always engaging in discussions, happy to set up a call, not limited to vehicle producers. We are exploring. You need to collaborate in this space. Q: Are MOIA AD tech agnostic? A: We are focusing on fleet operations, passenger interaction/interface. In a way we are agnostic to the driver and vehicle, but also strategic to who we partner with.
MAN Truck & Bus	MAN Truck & Bus presents themselves Q: Have you chosen an AD kit partner? A: Not finally, can't tell at this point Q: You mentioned replacement of the driver function. Can you elaborate on what you mean by that? A: Driver is now a social entity (answering questions, lost&found, calm school kids arguing etc.). There are a lot of tasks not covered by the AD today that have to be solved in other ways.
Sensble4	Sensible4 presents themselves Q: Is it possible to standardize the SDS AD kit/vehicle integration? A: In some limit, it's possible to standardize, but what we have learned, its always a bit fitting from both sides – both vehicle provider and AD kit provider. At least a little bit too early today.
Q&A	**Q&A Session** Q: To Ruter: How can you ensure that on-demand services replace private cars and not cycling/walking? A: Going to have to work with political management, creating a service that actually can replace the need of a private car is going to be necessary to politicians to put in place restrictive measures against private cars. Political regulation is needed, but you need a service before regulation. A: Might cannibalize cycling/walking but depends on how you introduce the service. You might for example have areas without on-demand vehicles.

	From Rutter's perspective sustainable freedom of movement is important – the solution we give to you as customer might not always be the AV. Q: To Ruter: Are you going to have different use cases served by different players? A: We want to move forward with what we can when we can, we are not going to sit and wait for that one solution to serve all needs. Q: To audience: How many of you have been riding in a vehicle without a safety driver A: (3-4 hands). Shows something about the maturity today - we must move forward. Q: We see a majority of Nordic and German representation here today – why not others? A: We would have loved to see other players as well, ex. Cruise, Waymo etc. here. We as a PTA can invite to the conference and spread the word the best we can. But we cannot choose and invite just some players. We have to create the same opportunities to all players. You were the ones interested in us, and we are really happy with that. Q: How do we ensure standardization among industry actors and the value chain? A: Don't think the entire value chain will be standardized by Ruter, Entur, nor anyone else. Our approach is more that we want the service and if standardization helps our agenda, well do that as well Q: To audience: anyone using teleoperation today, or when are you going to use it? A: Holo: will introduce as soon as vendors introduce it to us. We have the people, processes and systems there, we just need the vendors to give it to us. A: Oxbotica: We distinguish between real time teleop. vs remote assist: Vehicles should always be independently safe. Teleoperation as a supplement. Ruter: Vehicle needs to be safe in itself. Most of the challengers comes from understanding – if the situation is understood, then the vehicle can handle it most of the time.
Ruter	Ruter presenting results from the Menti survey conducted during breaks. **Closing of Conference w/ Bernt Reitan Jenssen and Endre Angelvik**

	The future requires our systems to change, not only the AV technology. Autonomous vehicles will change parts, but a part will come from data. Ruter has a data center today where you can see where people are – where they start and end their travel. Based on that we can provide new services. We have the potential to change how we operate completely. What we are doing here today is not only to announce a procurement. We need to create an ecosystem – creating the interface between the citizen and the new transport system. We very much look forward to the continuing. Ruter rounded up with practicalities around what's next, with potential 1-to-one-meetings. This will then lead to something, but we don't know yet exactly what. (Explained in the invitation, section 6.)