

## The Next Stop – State of the Art

### Shownotes

- **[Introduction]:**
- E-mobility and its implementation has changed so much and so quickly during last the decade. For those of us that are new to this domain, we wanted to give you an overview of how electric mobility has come along so far.
- What is now possible that wasn't a few years back? What has changed in terms of infrastructure? To find this out, in today's episode we interviewed three experts and asked them about the State of the Art of e-mobility and also way that lead there. This is Arjun Jamil and you're listening to "The Next Stop", the BSR electric podcast.
- To start off, I welcome Magnus Karlstromen and Ola Stensby from the Lindholmen Science Park in Gothenburg, Sweden. Ola has worked in Lindholmen for the last 7 years already. He is handling the topics of public safety and mobility, with a focus on e-mobility, especially during the last few years. Before, he had an industrial career at Ericsson, a Swedish telecommunication company for more than 20 years. Magnus joined the Science Park four years ago. But he's been involved with e-mobility for more than 20 years already. Besides from working in the BSR electric project, he writes the newsletter about e-mobility for a Swedish audience funded by the Swedish M&A agency.
- **[Interview]**

### QUESTION:

**Magnus:** okay. I can start a little bit. I think nowadays, electric cars are sort of a mass-market product in the sense that most of the OEMs are manufacturing the cars. They are looking into a future when they are going to sell a lot of electric cars. So nowadays, it's a mass market product, even though it's in its early days and the market share is not so huge in Europe nowadays.

The situation for some of the other transport applications like electric busses and electric boats are behind the curve compared to the cars, but they are also moving quite rapidly. For example, electric busses, I think it's around 2000 or 3000 electric busses in all European roads nowadays. Just a couple of years ago it was maybe a hundred. So it's moving quickly. And also, for electric ferries is sort of a rapid growth. Perhaps most in Norway, but also in other countries. Electric bikes have made their sell-success also. So I think this is moving into mass market rapidly, even though there are still problems for the products, I would say.

**Arjun:** Right. And Ola, what's your take on this?

**Ola:** My main reaction is that finally it is happening. That is judged only from my own private experience when looking up all the traffic on the highway back from office and looking at the different neighbor's garage and everything. I mean, there are a lot of electrical cars showing up these days. There has been a lot of talk and discussions about it, but now it's actually happening. Of course, there's always some interesting psychological aspect to the discussion. Why now and why not a year ago? What has actually happened? Is it due to, finally, the pricing and all sorts of governmental contribution being in place? Why now? Why not a year ago? The society was ready and the technology was ready a year ago as well.

**Arjun:** Right. Would I be kind of around the Mark in saying that it's the emergence of these cheap renewable energy technologies that have made this final push of making electric mobility a reality for us?

**Ola:** If you judge the situation in Sweden: I mean, it is still not cheap, so it's still more expensive than an ordinary, diesel or petrol car. But I think people started to get aware of the future, the situation with the climate and everything. So basically, I think it is younger people that, even though it's not cheap, they sort of show the road and take the role of the first adopters.

**Arjun:** Right. Magnus, you wanted to say something.

**Magnus:** Yeah. I think you are right about this. The technology's evolving and so is the consumer acceptance. There are also other issues that have supported this development. The product is basically much better. They are also cheaper, mainly because batteries are cheaper, but it's also an issue about that. Some of the main gear manufacturer had built up supply chain manufacturing capability to actually produce mass market products. I think that's also important for the possibility to get the prices down, even though there's not really a complete price parity right now, but in a couple of years it probably will be. So electric cars will be proximate at the same price as a combustion engine

And of course, as Ola told you before, it's also governmental support because the main markets in Europe where the market sort of took off, like in Norway, it's supported by the government with different kinds of taxes, subsidies, and support schemes.

**Arjun:** Right. Speaking of, it brings us to our very important. Next part here: it's the, the project BSR electric. if you wouldn't mind telling us how did you get into the project, what was your motivation and what do you do in the project? Magnus, if you could go first, that would be great.

**Magnus:** I got involved in the project because I work the Lindholmen science park, and I have electromobility competence, so I've joined already in the beginning of the project, and my main part has been writing a report about some of the applications of electric mobility.

**Arjun:** Right. And what's your take on this, Ola?

**Ola:** I joined the project from the start as well. I don't believe Magnus or myself was involved in the actual application process for the project. We sort of joined, once it was decided. My role is mainly to take part in the managing the use cases' the implementation in the seven cities around the Baltic

Sea, as the project manager for work package three. In addition to that, I have been contributing some tasks of other work packages as well.

**Arjun:** Right. I think an important aspect here discussing the state of the art of electric mobility would be to discuss electric mobility in the Baltic Sea region. And in the frame of our project, we have certain work packages involved with analyzing what's the current state in the Baltic Sea region. If I'm not mistaken, you were involved with mapping the database of different projects around the around the region. If you could tell us more about that and what do you feel, would be the future of these little projects that have kind of popped up everywhere.

**Ola:** We did a task where we tried to plot in a database, on a map, different kinds of the electric mobility projects, basically around Europe, not limited to the Baltic Sea region. The purpose of that task was to be able to present to the use cases' people that there are experts in other cities in Europe that could contribute with the knowledge and experience sharing.

And the interesting thing is that when we started that work almost three years ago, if you went on Google or whatever search engine you're using and searched for projects compared to today, there has been a huge development and the number of projects that are commercially implemented has really grown.

That is the most interesting thing that - I mean, okay, there's different kinds of research projects, trials and validation projects and so on - but looking into the commercial implementation, that is really an interesting thing because then you're running the system.

**Arjun:** Right. And what's your take on this Magnus?

**Magnus:** I would agree with Ola, that this is the status now that most of those transport applications are moving in to a commercial face nowadays, so we are moving away from a demonstration phase to the launching phase. That is the really interesting thing happening right now.

**Arjun:** Right. I remember a story from one of our use cases being kind of hindered by the fact that our European manufacturers of e-vans have not stepped up their capacity to fulfill the needs of the commercial sector. Would you say that this is a problem across the industry and manufacturers really need to step up the game to meet the demand, or would you say that it's going well as of now.

**Magnus:** I would argue that nowadays that the sort of the possibility to buy electric vans and electric trucks is improving. So it will be much easier to do this kind of project now because the major OEMs are already starting to build electric trucks. So it's easier to find them now than it was when we started the BSR electric.

**Arjun:** Right. And what about you, Ola?

**Ola:** Correct. So we had a use case in Denmark using e-mobility trucks for city logistics. They were delayed in the project due to the fact that they weren't able to find suitable trucks. That took some time. Thankfully, they were able to manage to get their hands on a couple of trucks in different transport classes. So they could start the project and it became a success, that's for sure. But it also shows that there has been some development in the market itself during these three years that the project has been running.

That is basically due to the exact thing that you stated starting the question: The European truck companies were delayed because they were already in their own product cycles and it takes time to implement the electric mobility into an existing program of trucks and buses and everything.

So in many ways it's easier to just start up a new product based on the electric mobility rather than implemented in an existing generation.

**Arjun:** Right. These big OEMs, as far as I understand, have product life cycles that go on for perhaps multiple decades for a singular platform. And you are correct that implementing a new idea in mobility into the existing life cycles can prove a little bit challenging. I would like to talk a little bit about the, the policy side of things. What initiatives have the governments especially in the North done in particular that you think has helped the adoption of e-mobility?

**Magnus:** I think the Norwegian market is very special, you know, they have a market share of plug in electric cars of 50 to 60% which is huge.

And I think they have made a package of different policy support. The main thing in Norway is that they don't really have any subsidies for electric cars.

They taxed normal petrol cars. So the price difference between an electric car and an internal combustion engine is mainly about that you actually tax the petrol/diesel cars in Norway. So it's supported that way. It's not so much like a subsidy to actually purchase the electric car. They also have a lot of different other kinds of support schemes: you are allowed to have free parking and drive on bus lanes, a package of supports.

And that is the reason why Norway is so successful. They have also other things that are important. They are quite rich compared to most of the Europeans, per ??? at least. and that is, of course, a positive thing, if you want to buy expensive cars, in the beginning at least.

They also had quite a lot of support for charging infrastructure in the beginning. All of this together has made this huge market share in Norway possible. But they also look into the other transport applications like electric ferries, which will be probably be one of the major things they will do in Norway to support their own industry. Because you know, electric cars, it's not so much about supporting your industry in Norway. It's more about reaching the environmental goals, but for the ferries, it's to actually develop an industry that they can sell to the rest of the world. And they are going to have a lot of electric car ferries in Norway. Electric buses are also important in Norway. And even though our Norwegian neighbors are really successful, even Sweden had quite a large market share. We have like 25% right now.

And one of the reasons why we have at this, is this specific scheme to support buying an electric car. It's called bonus-malus, which basically means that you get the bonus if you buy an electric car.

And you buy a diesel engine car, you will get a fine. So basically, the relative price difference is quite a lot in Sweden nowadays. This is also supporting the quite large market share in Sweden.

**Arjun:** Right. What do you think about e-mobility in micro mobility solutions like e-cars and e-bikes? Have you seen any implementation methods or laws that you found interesting and would really help the market basically?

**Magnus:** If I start, I would say that one of the things that has surprised me mostly during those days looking into electric mobility, is the development of the market for e-bikes.

Like this e-kickbikes, by different companies, because they were basically evolved without any kind of governmental support. So that's really interesting. Even though there's a lot of debate, how you should regulate them nowadays: If you actually should forbid them or whether you can only drive in specific speeds or where you can use them and where you can park them. It's a local debate all around in Europe about this. But I think what's really interesting is that it happened basically without governmental support. one of the things. Discussed a lot in Scandinavia, but also in Europe, about eco mobility is traffic safety. How they actually interact with other people, like people walking and cycling in the traffic environment.

How to integrate them without increased accidents. But I think the scientific opinions are divided, but that's an interesting point.

Did I answer your question?

**Arjun:** Yes. That was very interesting. Ola, do you have a take on this?

**Ola:** My only take is the local observations and explaining experiences from the Gothenburg region. So, I mean, we have been having a rental bike pool for a couple of years. When shifting now, they're still on conventional bikes, because I don't believe that Gothenburg city actually thinks that this technology is ready for commercial use in a big bike pool. Right or wrong, I'm not the one to judge, but I think they're afraid of the charging system and the durability of it.

Having said that, I have same experiences and observations from the traffic as a private person. You see more and more people, youngsters, young mothers and fathers with the kids in the cargo bike on the way to the daycare center. That used to be a rather rare site in the morning traffic in the Gothenburg area. But you know, I can't go to the office without seeing them today, so there's a shift for sure.

**Arjun:** An interesting social shift, right.

**Magnus:** One of my observation is also about electric bikes. At least in Gothenburg and also in other parts of Sweden, I think some of the older people are starting to bike again because it's easy for them to use an electric bike to be able to bike in the city environment.

And for example, a city like Gothenburg is quite hilly, so it's difficult to use an ordinary bike if you're a little bit older. But with an electric bike it's possible, I would say. Even if you don't have an extremely good stamina.

**Arjun:** And if I'm not wrong, I think e-bikes are also less dependent on charging infrastructure because consumers could charge them with a plugin outlet. This way, the government doesn't need to put that much effort into the charging infrastructure. Perhaps the grid infrastructure, yes, would need to be improved to support these micro mobility solutions popping up everywhere.

But do you think that the government has a less involved role when consumers decide to pick a micro mobility solution compared to an electric vehicle, for example?

**Magnus:** Yes, absolutely. The quick answer is "yes" because you don't need so much power and even if you need some kind of public recharging, it's cheaper to do it for the government. And if it's supported for the government, ???For Patro, for example, publish watching this or Trump or something like that????.

And if you own your own micro mobility, you're own e-bike. You can bring home your battery directly from the bike and charge inside your home.

**Arjun:** Right. So that brings us to the final term of our interview. If I may ask, do you have any initiatives that you'd like to lead the listeners to. Current projects, interesting things that you're doing, things that they could look at and get to know more about your work in e-mobility?

**Ola:** Yeah. Within Lindholmen Science Park, we are running a number of parallel projects concerning this area. I would suggest the listeners to log on to the internet, then go to [lindholmen.se](http://lindholmen.se), our website. And choose the English version for easy reading, of course, and read about what we are doing in this area. We have a number of projects with electric mobility. We have had busses for quite some time and now we have garbage or waste collecting trucks. We have the different kinds of City logistics-projects and there are a number of parallel projects with a lot of useful information to find on the website.

**Arjun:** Magnus. Anything to add?

**Magnus:** Yeah. I would recommend the people listening to this podcast also go to our LinkedIn and check out the BSR-electric group. There you find some information and news about the electric cars, etc. You can also connect to people that have been involved in BSR electric, that's a possibility for you. There are a lot to good conferences about the electric mobility and one of the major one is the electric vehicles symposium. That is every year. This year it will be in United States, but I think it will be in Europe soon again. And that's one of the major conferences if you want to check out what's happening in the business.

I could also recommend that there's an electromobility organization on European level for four different companies and cities called Avere, which is nice to be involved.

I am employed at Lindholmen Science Park, but I also work in the research community in Sweden, and we have a competence called Swedish electromobility centre, which is useful, if you want to get into contact with Swedish researcher in the area. It's a good way to start contact with the university world of Sweden.

**Arjun:** That's very interesting information for our listeners as mainly our target group is decision makers and researchers in e-mobility and I'm certain positive that they would appreciate this information very much. Also, speaking of events, one important event coming up for us is the final conference and it's taking place on home turf for both of you. Could you tell us a little bit more about that and kind of motivate the listeners to attend?

**Ola:** Yeah, that's correct. It's been arranged in Gothenburg in the first place. Dew to Corona, there's a big question Mark, whether we will have an ordinary conference which you can travel to and take part in, or if we do this as an online version instead. But there are good things and bad things in both ways, actually. So we have had the experience, right this week, that the online meetings and conferences actually gather more interest and more attendees than a physical conference. That's really interesting. So it's easier to log on to interesting sessions than travel to Gothenburg.

That's an interesting observation. Nevertheless, we are going to show basically everything that has been done in Gothenburg city with the real time demonstrations and if it happens that we need to do this online, we will do this as a movie production instead. So basically, we present all the projects that had been done in the Gothenburg region with electric ferries, electric buses, electric trucks, and

electric waste collecting vehicles, so basically all sorts of electric projects we have been doing in the Gothenburg area.

And also, some of the major players in the industry will take part in the conference to present their thoughts about the future and what kind of product or systems they have up their sleeve.

**Arjun:** That sounds lovely. Magnus, anything to add?

**Magnus:** Not really. We've been working on a lot of interesting stuff and we're very proud to show what we are doing.

**Arjun:** Right. I'm totally looking forward to it. Virtual or in person. I'm sure. I would appreciate it a lot more in person because I've heard Gothenburg is a very beautiful city. but either way I guess we'll definitely see the both of you there. Including some of our listeners perhaps.

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**[leading over to next interview partner]** Ola and Magnus have told us a lot about the overall changes and also the State of the Art of electric mobility in all its different forms in the BSR area. Our second interview partner, Grzegorz Krajewski, is going to tell us a lot more specifically about the use case in his BSR city, Gdansk, and the level of implementation of e-bikes there and in the rest of Poland.

Grzegorz works as a project manager in the active mobility unit of the city of Gdansk, where he's working with projects promoting cycling and walking. As he is also part of the municipal mobility strategy team, he is not only working on active mobility projects but mobility in the city of Gdansk in general. As a mobility expert, he sometimes consults when designing new parts of city infrastructure, mainly cycling infrastructure.

– **[Interview]**

**Arjun:** So, Grzegorz, before you started the work, what was the status quo of Gdansk in terms of active mobility or your domain of work, and how has it changed since?

**Grzegorz:** Our active mobility unit in the city hall came into life in 2011, so nine years ago. It was eight people then, we dealt with three EU-projects. Back at the time, measured in 2009, so two years before the active mobility unit was started, the modal share of cycling and walking was at 2%. The approach towards active mobility, towards cycling was more or less linear. That means that it was regarded only in terms of cheap cycle ways, not continuous, used mainly for recreation, very little parking facilities, and so forth. So, we changed that thinking into a spatial approach. In this approach, you are entitled to easily move on your bicycle anywhere in the city

And apart from main streets, the streets are calm with speed limits at no more than 30 kilometers per hour. This special approach, approaches the whole mobility in the city, it doesn't focus on cycling infrastructure only.



In 2016, the modal share was counted again. It was measured at 6%. So I guess our efforts really paid off and Gdansk was regarded as a cycling capital of Poland for six years in a row. We are more or less in very strong competition from the city of ???, in the South of Poland, that has better climate, better geography, better topography and the city is not so spread out as Gdansk is.

In the last edition of this competition for cycling capital of Poland, they won. But we won that six years in a row before that. Now we are 12 people in our unit.

**Arjun:** Okay. First of all, congratulations on the increase in modal share and I'm sure you'll get ??? The next year. It's very optimistic, hearing this good news about people picking up cycling. If I may ask, why was the focus on active mobility instead of other forms of transport?

**Grzegorz:** Our thinking was infrastructure first when it comes to cycling and walking. Then other forms of transport. For example, we didn't have any public bicycle system. It only came to life very late, last year. We were the last city in Poland, the last big city in Poland, which didn't have this public bicycle scheme at the time before that. But as I said, we focused more on building a good quality infrastructure in the city and making the city very bicycle friendly at first.

In our city development strategy, cycling and walking is positioned first. So, you have to focus first on infrastructure and conditions of walking and cycling in the city. Then you can focus on public transport and then, only then, you can go into conditions of cars moving about the city.

**Arjun:** And if I remember correctly you once told me about the mayor of Gdansk making very ambitious goals and promises because he was inspired from another region and that's why these rules came by. Could you tell us that story?

**Grzegorz:** Yes, it was even before our active mobility unit was started. It was, I guess in 2010. It is velo-city and it was in Denmark, in Copenhagen. We visited Denmark, we visited Copenhagen and this conference and took our mayor to this event. First of all, he met a lot of interesting and very inspired people from all over the world towards cycling. And second, he visited one of the best cities when it comes to cycling. One of the best cities in the world in this respect and so he came back to Gdansk and was totally inspired. He made a step towards making our active mobility unit alive and gave us the green light for big changes in the city towards active mobility.

**Arjun:** Right. And were there any goals that were set by the mayor after this?

**Grzegorz:** Our mayor, at the velo-city conference in Copenhagen, signed the charter of Brussels and it contained a goal of making Gdansk a very bicycle friendly city with 15% of modal share of cycling in 2020. Of course, it was a very ambitious goal. Now we didn't meet this, but as I said that four years ago when this modal share was measured in Gdansk, it was measured at 6%. We are sure that it is growing since then because we have 28 bicycle counters in the city. It is automatic bicycle counters measuring the level of cycling. And probably this level of cycling is at between seven and a half and up to 8% of cycling. We are closer towards this goal.

**Arjun:** Right. It's interesting because at another interview for these podcasts the guests told me that ambitious goals from politicians really help decision makers and policy implementers like yourself to fast track their goals. For example, if you needed more bicycle lanes, you could then refer to these ambitious goals from the decision makers to then implement your agenda. Which I think is a very



important thing for our listeners. Some of whom are decision makers and policy implementers like yourself from the city governments. And I think this is a very important thing to have a target goal to reach so that other departments could also then kind of join together in this common vision.

**Grzegorz:** Absolutely. It also gives a clear agenda for other people to follow.

**Arjun:** All right. So this brings us to BSR. As our **readers** might know, you're a partner in the BSR project. For some people who don't know, would you mind explaining what your use case is and what do you do for it?

**Grzegorz:** All right. So we are very glad to be a part of the BSR electric project. In this project, which investigates why we use e-mobility so little up to now, and what are the obstacles. It also shows, what we should do more to make the use bigger. We focus on e-biking, and to a lesser extent on e-ferries. So as I said, we are focusing mostly on e-bikes and we had six e-bikes leased and prepared for lending them to people for individual testing. You could also take part in tourist trips about the city on those e-bikes.

We also created bike to work campaigns and promoted e-bikes in those campaigns. These campaigns were in effect in September and October last year and the year before.

They were effectively bike to work campaigns, which encouraged people to commute by bicycle, normal bicycle, or by e-bicycle on everyday basis. We had that discussion before, if we should make a separate campaign for normal bikes and a separate campaign for e-bikes and we came to a conclusion that one campaign was the best way to promote e-bikes and to reach as many people as possible. The participants registered trips and distances covered by bicycle during that time with a smartphone app and they collected points. In the end, those who collected most points were entitled rewards. There was a competition on individual level and on firm and company's level. There were two campaigns, in the first one, we had around 3,500 participants and 300 firms and the second had over 4,500 participants and nearly 300 firms and companies.

**Arjun:** Oh, that's great.

**Grzegorz:** And we think it was a big success, especially on the level of encouraging businesses, firms and companies to go into this bicycle and e-bicycle promotion.

Apart from that, we created webinars on e-bikes. Those are available on the BSR electric projects. So everyone who is interested can listen and watch this webinar. It is important that it didn't focus on difficult issues. It was a rather simple introduction to the e-bike. That was because before, in Gdansk e-bikes were not a very common machine to be spotted and people didn't have enough knowledge about e-bike and didn't know what it is about. So we decided to focus on the very basic level of e-bike introduction for everyone.

**Arjun:** Right.

**Grzegorz:** Those were the main activities of Gdansk in the BSR electric project when it comes to e-biking

**Arjun:** Right. And what did the e-bike testing look like? Where did you go? What were the routes you took? Perhaps, what were the opinions of the testers of the six e-bikes that you tested?

**Grzegorz:** All right. So we had six e-bikes and ready for individual testing for a limited period, usually it was up to a week. After that, people gave us feedback what it felt like with the bike. Was it useful for them? Those were short interviews. Apart from that individual testing, we provided e-bikes for e-bike tours in Gdansk. We also organized those e-bike tours with instruction about the bikes. And we merge it with tourists visiting the city. So, not just going around the city without any purpose.

**Arjun:** Right.

**Grzegorz:** You are able to get learn something about the city. And to learn about the bikes.

**Arjun:** Right. I'm sure that this helped the image of e-bikes in general, in Poland and in Gdansk in particular. If I may ask, how did the people of Gdansk react to the testing also to the tours also to the e-bike sharing program.

**Grzegorz:** So as I said, many people didn't know much about e-bikes. E-bikes are a great mean of transportation, they are just like normal bikes, more efficient, especially uphill, and Gdansk is quite hilly. Half of the city has a very difficult topography when it comes to cycling.

For example, my road, back from the city center to the place where I live is six kilometers further more than 100 meters uphill. And it is quite strenuous. And in this respect, e-bikes are a very good answer for increasing cycling in Gdansk or in other cities that have similar topography.

We had a lot of enthusiasm from people who tested the e-bikes. Especially from people who didn't like normal bikes, didn't like the sweat, the efforts and now they could experience easy biking.

Many were declaring that they were going to buy one afterwards. Of course, the high price of the e-bike might be the obstacle. But when many people saw, how useful this e-bike is and how it is very close to normal bicycle, but way easier to ride on, they consider spending this amount of equivalent to 2000 Euro on an e-bike as a serious option. Before, when they heard about this high price of e-bikes, they were negatively opinionated towards them.

**Arjun:** And it might have also helped to introduce the bike sharing program for people who couldn't afford an e-bike because it is not a cheap investment.

**Grzegorz:** Absolutely not a cheap investment and if you are going to spend so much money, this, of course, it is a good way to test e-bikes beforehand.

**Arjun:** Right. Speaking of the e-bike sharing program, what was your implementation methodology? What did you expect? What did you get? What were the results? Also, I've heard that Gdansk's e-bike sharing system is one of a kind in the world. Could you tell us about some other projects that you got inspired from?

**Grzegorz:** All right. So as I previously said, Gdansk didn't have any bike sharing system. We focused more on infrastructure, on bicycle promotion and so forth. But now, when the infrastructure was ready, when people were ready, we decided that it is time to introduce a bicycle sharing system into Gdansk. We were determined to make it a state-of-the-art system, very modern and very useful in our hilly environment. The answer was to make it partly containing e-bikes.

We didn't know that we will get in a system that consisted entirely of e-bikes. But we were determined to get a system which consisted with a good share of e-bikes. In the end, we received a

system which was made of and entirely e-bikes. It was 4,000 e-bikes to be implemented in the final state of the project. But the project was divided into two stages.

The first stage was 30% of the fleet to be introduced in Gdansk. It was completed. So we had over 1,200 e-bicycles deployed in Gdansk and nearby towns, and the system was unique in a way that it consisted only of e-bikes with batteries being swapped. So the e-bike didn't have any docking stations. It was a dockless system. And the batteries had to be swapped by service people from the operator. Unfortunately, at this first stage of deployment, the operator miscalculated the costs of operating such a system and the batteries were changed to a sparsely, not enough ??? and actually it didn't work very well. There were some quality issues: weak frames, the tires were susceptible to punctures. We had very few acts of vandalism, which we are very proud of.

But other technical problems were, for example, the locks on the system. When you wanted to rent a bicycle, you came up to a bicycle, turned on an application on your smartphone, and then had to unlock the bicycle. To open a special lock on the rear wheel of the bicycle. This worked on and off, I must say. So it didn't work very well. The system had some technical flaws.

**Grzegorz:** Together with the operator not being able to provide good quality service, relocation and battery swapping, unfortunately, it was stopped at this stage and we are looking onto another public procurement, for the Mevo II, which will be designed in a better way.

**Arjun:** All right. I've heard that Gdansk's e-bike sharing program, Mevo I, was one of the cheapest. Would you mind telling us a little bit more about the pricing structure and also telling us about these issues that the operator faced because of such a low price.

**Grzegorz:** Our look at the system was that it had to be accessible to everyone. One of the obstacles on access to these systems might be the price. So we put the price for using the system by normal users on a very low level. It was about two and a half Euro per month to use it or about 20 Euro per year.

So it was quite cheap. And this low price also made it very popular among users. So it was our goal to make it very popular. But the low price made it even more popular than the operator...

**Arjun:** Too popular.

**Grzegorz:** I'm afraid to use it this way, maybe a bit too popular.

The price is a factor where you can regulate the popularity of such systems. And when setting this very low price, we looked at, for example Krakow, a city in the south of Poland, which put the price at twice of that amount. They didn't have much popularity in the system. Their system was simply too expensive for people to use it. At least people voted with their wallets, I'd say, not to use it because it was too expensive for them. So we put the price at half of that level in Gdansk. Unfortunately, maybe that price was too low.

**Grzegorz:** At the same time, if you look at other systems in Poland, you can use such systems basically for free. For example, in Warsaw, the same operator has a very big system of public bicycles and they give everyone the first 20 minutes for free. Which actually means that you can use a bicycle for 20 minutes, then change for another bicycle, and make the whole journey for free.

**Arjun:** well, thank you so much for that pricing explanation. In what ways does the second generation of the program aim to be better? What are the changes between the two?

**Grzegorz:** Well, definitely, we are aiming towards better quality. It has to be enforced. We are aware that it will cost more. Quality always costs more. Maybe a different model of battery charging. We'll probably be introducing a few thousand points in the city where batteries can be charged into this project. It is now being prepared. But I say that the fourth generation of this public bicycle scheme, which is dock less with, with a computer in itself, it's a must. We will not go one step back towards the docking system. Because this fourth generation makes it very easy for data collection.

The excellent access to data about the bike usage, about the bike position on at ??? Level, gives us a very good control, not only on the whole system, but also on the operator. In this way, we can enforce good quality of the service operator.

**Arjun:** Right. It's very interesting that you chose a data collection is one of the key points because in some other use cases that we've been speaking to, rider behavior is a very important aspect in determining the success of an immobility mode, would you say that it's the same in terms of e-bike sharing programs? Does rider behavior effect the scheme significantly?

**Grzegorz:** Yes, definitely. Thanks to that data, we know where bicycles are moving about the city. We can make up for a non-existent cycling infrastructure in those parts, where we see that it's very popular among those users. We know where they started the journey and we know where they end the journey. So we can provide better services or more bicycles at those points and we can adjust the whole system according to the real-world usage of the system. This data is very, very useful. Especially combined with data from cycle counters in the city. As I previously said, we have 28 bicycle counters in the city.

**Arjun:** Right. Grzegorz, thank you so much for explaining Gdansk's e-bike initiatives. If our listeners have more questions for you in terms of technical implementation or policy implementation issues, how could they connect with you? How can they reach out to you?

**Grzegorz:** They can reach out to me through the BSR electric project website. That's the easiest way.

**Arjun:** Right

**Grzegorz:** We have also our website about cycling in Gdansk, but at this point, it's in Polish only. But at Gdansk.pl, that's the main official website, you can easily find people responsible for cycling in the city of Gdansk, one of them is myself.

**Arjun:** Great. I will make sure to include these links in our descriptions and I hope to speak to you soon again, Grzegorz. Thank you very much for your time.

**Grzegorz:** Thank you very much.

**--Outro Music**

This episode of The Next Stop was produced by me, Arjun Jamil. Co-produced by George Matthews and technical support and music by Jona Scholz. We're a part of the project BSR-Electric and are proudly funded by the Interreg Baltic Sea Region Electric.

We're introducing an online learning course for decision makers, researchers and stakeholders invested in the electric mobility revolution, just like you. To find out more, check out our website at [www.bsr-electric.eu](http://www.bsr-electric.eu).

We're also holding our project's final conference online as an Open access resource, meaning it's completely free of charge with interactive presentations, joint learning and networking opportunities. Come join us on the 16th till the 17th of June 2020- to register please follow the latest updates on our website!

Our working team is based out of the Hamburg University of Applied Sciences at the Research and Transfer Centre for Sustainability and Climate Change Management. Thank you for listening in and I hope you tune into our next episode, coming soon!

Here are the links mentioned in the podcast:

- BSR electric's LinkedIn: <https://www.linkedin.com/groups/13561920/>
- Lindholmen Science Park: <https://www.lindholmen.se/>
- Electric Vehicle Symposium: <https://www.evs32.org/>
- Avere: <https://www.avery.org/>
- Swedish Electromobility Centre: <http://emobilitycentre.se/>
- Gdansk's Website: <https://www.gdansk.pl/>